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The Antecedents and Influence of Market Liquidity of Family Firm Shares

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LIST OF ABBREVIATIONS

BMBF	German Federal Ministry of Education and Research
CEO	Chief executive officer
CFI	Comparative fit index
DCGK	German Corporate Governance Codex
Dr.	Doctor
e.g.	Exempli gratia; for example
F-PEC	Family influence scale (power, experience, and culture)
i.e.	Id est; that is
IHK	German Regional Chambers of Industry and Commerce
IPO	Initial public offering
ln	Natural logarithm
MIMIC	Multiple indicators and multiple causes model
n	Number of observations
OLS	Ordinary least square
p	P-value
Ph.D.	Doctor of philosophy
Prof.	Professor
R ²	Coefficient of determination
R&D	Research and development
RBV	Resource-based view
RMSEA	Root mean squared error of approximation
SD	Standard deviation
SEW	Socioemotional wealth

SME	Small and medium-sized enterprises
SRMR	Standardized root mean squared residual
TMT	Top management team
TLI	Tucker-Lewis index
VIF	Variance inflation factor
WHU	Wissenschaftliche Hochschule für Unternehmensführung

INTRODUCTION TO THE THESIS

BACKGROUND AND MOTIVATION

Family firms are often depicted as long-term-oriented traditional entities that can continue to operate successfully for centuries (The Economist, 2015). Various studies support the notion that owning families in general follow a transgenerational orientation (Chrisman, Chua, & Litz, 2004; Chua, Chrisman, & Sharma, 1999; Gomez-Mejia, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes, 2007). Consistent with this, selling the company or shares thereof is seen as a last option or even family failure by many practitioners (Ward, 2004). However, a frequently quoted statistic says that only 30% of all family firms make it to the second generation and only about 3% of them survive beyond the third generation (Family Business Institute, 2009). Consequently, a considerable number of family firms ceases to exist altogether going into bankruptcy, or evolves into other organizational forms (e.g., through a sale of ownership). Family firm performance and reasons for family firm bankruptcies have received considerable attention from researchers. In contrast, family firm sales have been largely neglected in the literature. This is surprising, given the dominant role that family firms play in all major economies (Klein, 2000; La Porta, López-de-Silanes, & Shleifer, 1999; Le Breton-Miller & Miller, 2006) and the frequency of sales, as depicted in extant literature on management buy-outs and private equity (Scholes, Wright, Westhead, Bruining, & Kloeckner, 2009). An increased understanding of antecedents and outcomes of family firm sales hence holds promise for scholars and practitioners alike.

One of the primary antecedents of a sale is the analysis of an asset's market liquidity. Without potential buyers of their shares or company, family firm owners are severely limited in their operations, with non-existing exit options down to the inability to raise equity money. This gains further importance, as not only are the owning families

personally undiversified, with their large blockholdings in one company, but family firms themselves generally lack diversification (Anderson & Reeb, 2003b; Villalonga & Amit, 2006). This extreme case of unsalable shares is not the only influence on family firms. Different levels of market liquidity have also been found to influence companies in multiple ways. Mostly focusing on regulated markets, the finance literature has shown that high liquidity of shares can increase investments and economic growth (Henry, 2000; Levine & Zervos, 1998), lead to higher share prices (Amihud & Mendelson, 1986a, 1986b), and influence multiple other aspects of a firm such as its corporate governance, executive compensation, and corporate policies (see Foucault, Pagano, & Röell, 2013). Even without actual sales taking place, liquidity can have an influence on a company's management through the threat of sale by shareholders (Fang, Tian, & Tice, 2014) or on minority shareholders by "hostage taking" through low liquidity (Schulze, Lubatkin, Dino, & Buchholtz, 2001). This can have significant effects on the management's and shareholders' behavior, influencing long-term strategic orientation or communication among family members.

In spite of its importance, liquidity of family firms has not been analyzed thoroughly. While recognizing the importance of family firms has led researchers from various fields, including finance, to analyze the specific characteristics of this form of organization (Gedajlovic, Carney, Chrisman, & Kellermanns, 2012), the financial literature has focused primarily on publicly held corporations (Romano, Tanewski, & Smyrnios, 2001). Moreover, Yu, Lumpkin, Sorenson, and Brigham (2012) maintain in their study of dependent variables applied in the field of family business research that out of those papers that focus on the financial structure of family firms, the majority analyzes the firms' source of capital. Even though some studies in the research field of finance analyze the differences in liquidity between listed family and non-family firms primarily

based on their disclosure policies (e.g., Ali, Chen, & Radhakrishnan, 2007; Anderson, Duru, & Reeb, 2009; Chen, Chen, & Cheng, 2008; Wang, 2006), the results are still inconclusive (Chen, Dasgupta, & Yu, 2014). With regard to privately held family firms, no detailed empirical research has so far been conducted, as all commonly applied measures of liquidity depend on a certain trade volume or are at least based on the measurement of non-trading times (Foucault et al., 2013). These measures are, however, not applicable for studies on privately held family firms, as long holding periods often lead to years and decades without any trades. Family firm research has therefore excluded liquidity from its analyses while the literature on liquidity has left out any focus on privately held firms.

In order to examine academically the link between family firms and liquidity, it is necessary to understand the underlying fields of research. One of the key aspects of family business research is the inseparable combination of two distinct entities, namely the business and the family (Gersick, Lansberg, Desjardins, & Dunn, 1999; Pieper & Klein, 2007; Tagiuri & Davis, 1996). Both entities and the combinations thereof result in various goals that distinguish family firms' behavior and policies from those of non-family firms. These goals eventually lead to different measures of success. Most importantly, family firms strive not only for financial gains, but also seek to increase their non-economic utility even when this involves economic loss or greater risk (Gomez-Mejia et al., 2007; Miller & Le Breton-Miller, 2014; Schulze & Kellermanns, 2015). Liquidity can be defined as the "ease of trading a security" (Amihud, Mendelson, & Pederson, 2005: 270) or "the ability to trade a security quickly at a price close to its consensus value" (Foucault et al., 2013: 8). Due to its focus on public (mostly) non-family firms, the literature on liquidity has from its beginning focused on possible economic impacts, for instance reduced cost of capital through lower expected returns with higher liquidity (Amihud &

Mendelson, 1986a, 1986b) or increased bid-ask spreads with lower liquidity (Amihud & Mendelson, 1986b).

While this puts liquidity in the center of consideration among investors and short-term profit-oriented public corporations, family firms, with their focus on non-economic goals and their tendency to pass on their shares instead of selling them (Anderson, Mansi, & Reeb, 2003), might not consider liquidity one of their key aspects. However, this does not take the whole picture into account. Although family firms might have longer holding periods of their shares – especially in privately held family firms – once a sale is considered by an owner or the whole owning family, liquidity of their shares or company plays a crucial role. With most of their wealth concentrated in their company and therefore generally lacking diversification (Villalonga & Amit, 2006) owning families are financially highly dependent on their company and, when necessary, its efficient sale. Especially in times of crises, owning families can be financially dependent on a quick sale of their company. However, studies show that little diversification amplifies the role of liquidity risk, i.e., the difficulty and costs to sell in times of crises (Acharya & Pedersen, 2005; Ruenzi, Ungeheuer, & Weigert, 2015). But even without the intention or necessity to sell their shares, family business owners are influenced by the liquidity of their shares. Family firms often rely on patient capital that is invested “without threat of liquidation for long periods” (Sirmon & Hitt, 2003: 343). Accordingly, managers might act differently, depending on their perception of the probability of a sale. On the one hand, when liquidity of the firm’s shares is high, managers might be under short-term performance pressure to avert sales. On the other hand, the option to sell might encourage otherwise passive shareholders to become active in the firm when they do not take their share ownership as an unchangeable fact, thereby adding resources to the firm. Both tendencies might have significant effects on key aspects of family firms’ long-term

survival, such as their innovativeness. Lastly, even though some research has been conducted on the liquidity of listed family firms (e.g., Ali et al., 2007; Chen et al., 2014; Wang, 2006), little has been done to understand different preferences and policies among family firms in the context of liquidity. Analyzing these differences might not only increase our understanding of family firms, but also add to the mainstream literature by explaining tendencies that have so far been excluded from the discussion as irrational. Whereas the literature has depicted shareholders as a uniform group that always prefers more liquidity of their assets (Foucault et al., 2013), research on family firms' liquidity can add more explanations to this topic by including families' non-economic preferences. This, in turn, can offer new ways to analyze so far unexplainable behavior and outcomes in the fields of finance and management.

Summing up, little research has been conducted on the liquidity of family firms. Furthermore, the liquidity of privately held family firms has been excluded from academic research altogether due to the lack of an appropriate measure. This is in contrast to the importance that liquidity can have for family business owners but also for the field of family business research in explaining the possibilities and reasons for a sale and the effects of higher or lower share liquidity on the management and owners of a family firm. The importance of liquidity as a crucial part of the analysis of a family firm's financial structure calls for further investigation. Consequently, this dissertation will focus on the liquidity of family firms' shares by introducing a new measure of family firm liquidity, analyzing the effect of liquidity on innovation, a key aspect of family firms' survival, and exploring the effects of varying preferences and generational differences among listed family firms on their liquidity.

RESEARCH OBJECTIVES

The overarching objective of this thesis is to expand our knowledge of liquidity of family firms. Building on financial and family firm literature, I aim to add insight to the antecedents and outcomes of the financial structure of family firms and broaden the scope of family business research. The three essays that together build this thesis each provide information about one important aspect of family firms' liquidity. Essay 1 builds the foundation for research on liquidity of privately held family firms by introducing a new measure of family firm liquidity. Essay 2 then applies this measure to analyze the effect of liquidity on communication and eventually on innovation as a highly important characteristic of family firm survival. Finally, essay 3 explores the role of family firm characteristics and generational effects on the liquidity of listed companies. I thereby aim to connect the findings of my previous studies with the research on regulated markets where the focus of the financial literature lies. This can provide the literature of finance with insights from family business research in order to understand previously unexplained phenomena. Accordingly, the following research questions will be examined in the course of this dissertation:

Essay 1: *How can we measure the market liquidity of privately held family firms?*

Essay 2: *To what extent does market liquidity of family firms influence their innovation outcomes?*

Essay 3: *To what extent do family firm status and generational differences among family firms influence the disclosure policies and liquidity of listed companies?*

Objectives of the First Essay

The main objective of the first essay is to provide a measure of the liquidity of privately held family firms. Although potentially an important factor that can influence both managers' and shareholders' behavior, liquidity has so far not been included in the analysis of privately held family firms, as no appropriate measure was available. Following Amihud et al. (2005), new measures of liquidity have to be introduced, where current methods are not applicable. This is the case for non-listed family firms, as current measures all imply that actual trades take place, even though some measures account for very few up to no trades in certain spans of time (Foucault et al., 2013). Still, these measures are not applicable in the case of family business research, as some firms do not trade their shares for years or decades in line with their transgenerational approach (Chrisman et al., 2004; Chua et al., 1999). Therefore, a new measure for family firm liquidity has to be based on the underlying definition of market liquidity, the "ease of trading a security" (Amihud et al., 2005: 270), instead of the actual trades taking place. The new measure leads to a new approach that relies on formative indicators that represent the determinants of the construct instead of relying on reflective items (i.e., trade volume) that represent its outcomes (see Diamantopoulos & Winklhofer, 2001). Therefore, I develop a new measure that is independent of the actual trades of shares of a company. I build a valid and reliable tool that enables us to analyze how easily shares of a company could be sold if the shareholder wanted to sell. In the course of this essay, I build on the method of formative indices (Bollen & Lennox, 1991; Diamantopoulos & Siguaw, 2006; Diamantopoulos & Winklhofer, 2001) and rely on primary data collected from (1) family firm experts, practitioners, and family business scholars to indicate the appropriate indicators and (2) a sample of family firms to externally validate my index of family business liquidity. This index provides the base for further research on the

influence of liquidity on privately held family firms and specifically lays the foundation for my second essay.

After the ability to analyze family firm liquidity, the second important contribution of this essay is the resulting feedback to the mainstream finance literature. While research on liquidity still mainly focuses on listed companies, exploring the liquidity of privately held family firms provides the possibility of understanding underlying motives and policies that are not necessarily connected to financial gains. The recent focus of family business research on non-economic goals (Gomez-Mejia, Cruz, Berrone, & De Castro, 2011; Gomez-Mejia et al., 2007; Schulze & Kellermanns, 2015) can provide the finance literature with explanations for so far unexplained results.

Objectives of the Second Essay

The objective of my second essay is to analyze to which extent the innovation outcomes of family firms are influenced by their liquidity. Focusing on publicly traded companies, Fang et al. (2014) show that higher liquidity impedes the innovativeness of a company, as it increases the risk of hostile takeovers and attracts passive shareholders that fail to control the management. This raises the question of whether liquidity influences privately held family firms' innovativeness in the same way or whether family firms' specific characteristics turn this influence in a different direction. The significance of innovation for the performance (Gopalakrishnan & Damanpour, 1997), growth (Aghion & Howitt, 1992; Baumol, 2004), and eventually long-term survival (Cefis & Marsili, 2005, 2006) of family firms shows the importance of understanding its determinants. Building on the index of family firm liquidity that I develop in the first essay and the resource-based view (Barney, 1991; Wernerfelt, 1984), I focus in this essay on the value that family influence and especially open communication among family

members can have on a firm (Habbershon & Williams, 1999; Segrin & Flora, 2011; Sirmon & Hitt, 2003). In this context I highlight the effect of liquidity on communication among family members which can result in added value through increased involvement of family shareholders (Ward, 2004). This eventually leads to improved innovation outcomes in family firms.

Following the theoretical development of my hypotheses, I test them, using a sample of German family firms in the mechanical engineering industry. This paper highlights the importance of incorporating the so far excluded factor of liquidity in our analyses of family firms. In addition, it contributes to the understanding of the determinants of innovation outcomes in family firms that are a key aspect of long-term firm survival. Lastly, it shows the effect of liquidity on open communication among family members and the effect of communication on innovation.

Objectives of the Third Essay

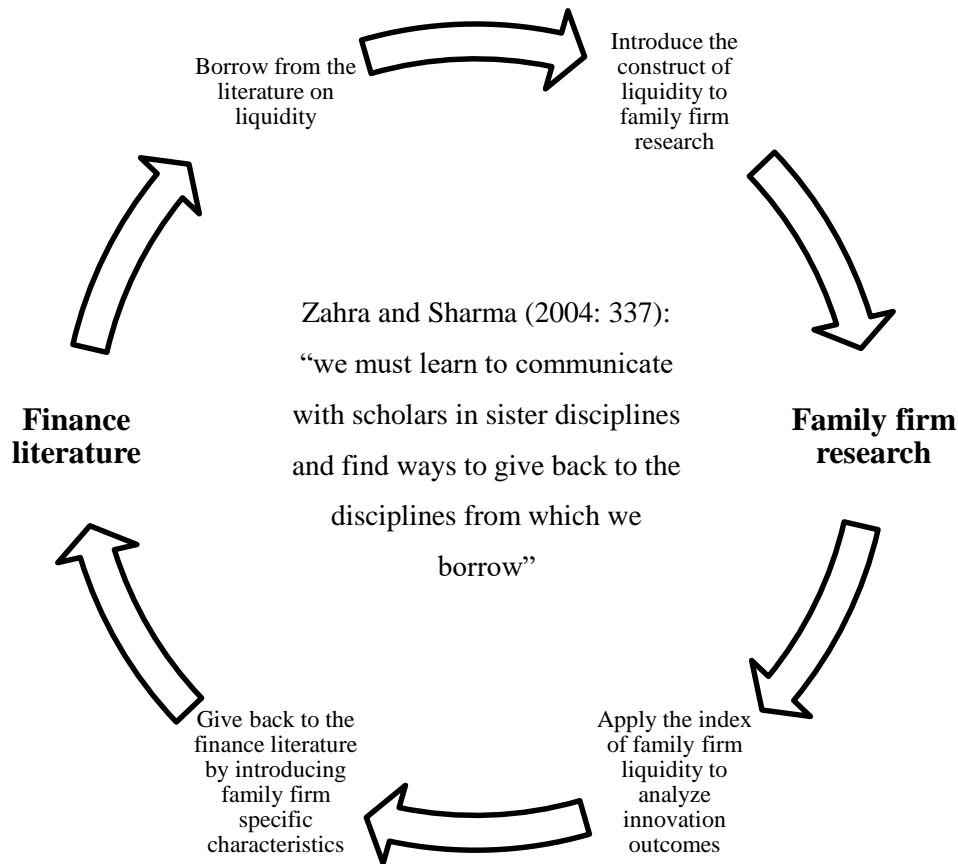
The focus of the third essay lies in the analysis of the effects of family firm status and generational differences within family firms on the disclosure policies and eventually on the liquidity of listed family firms compared to non-family firms. Building on family firm specific ownership structures and preferences, I further develop the link between family firms and liquidity in this paper in order to analyze which effects are transferable to regulated markets. Following previous studies in the field of finance that focus on liquidity and informational friction (e.g., Healy & Palepu, 2001; Stoll, 2000) and the influence of family firm status on disclosure and liquidity (e.g., Ali et al., 2007; Chen et al., 2008; Chen et al., 2014; Wang, 2006), I first analyze the effect of ownership structure and family firm specific characteristics on liquidity. Next, I explore the effect of family firm characteristics and generational differences on disclosure policies and preferences.

Last, I evaluate the effect these disclosure policies and preferences have on the liquidity of firms. The important difference in this context lies between real friction, using up real resources caused by the ownership structure of firms (Stoll, 2000), e.g., blockholdership and long holding periods (Brockman, Chung, & Yan, 2009) on one side, and informational friction, leading to illiquidity through information asymmetries between insiders and outsiders (Heflin & Shaw, 2000; Stoll, 2000), on the other side.

Building on this differentiation, I analyze family firm specific characteristics and generational differences based on agency theory (Jensen & Meckling, 1976) as already done by previous studies (e.g., Ali et al., 2007; Chen et al., 2008) and refine this scope by including families' consideration of their socioemotional wealth (Gomez-Mejia et al., 2007), as explored by Gomez-Mejia, Cruz, and Imperatore (2014). I test my resulting hypotheses using a sample of 225 family and non-family prime standard firms listed on the Frankfurt Stock Exchange.

Summing up, the three essays together trace an arc from taking liquidity as a key financial topic to family business research, over including liquidity in the debate on innovation, a central issue of the field of family business research, to adding to mainstream finance literature by including non-economic, family specific preferences in the debate on liquidity of listed companies (see Figure 0-1). I thereby fill the gap in family business research left open by excluding liquidity from the analyses in this field.

Figure 0-1: Connecting family firm research and financial literature



RESEARCH APPROACH AND COURSE OF INVESTIGATION

To meet the overarching research goal set for this dissertation and the individual goals set for my three essays, I apply several different approaches. The research goal for the first essay is to develop a valid and reliable measure of family firm liquidity. As outlined above, conventional measures, using reflective items, are not applicable with respect to privately held and rarely traded family firm shares. The objective for the first essay therefore is to provide a tool that is theoretically and methodologically suitable for measuring the latent variable liquidity of family firms. Unlike other characteristics, latent variables cannot be observed directly, but have to be deduced from other measurable

factors. The construction of a reflective scale is the most widely used method for this purpose (MacKenzie, Podsakoff, & Podsakoff, 2011). The advantage of a reflective scale construction is that this method is profoundly researched and well accepted (Churchill Jr, 1979; MacKenzie et al., 2011). However, it does not always fit the characteristics of the underlying latent construct (Bollen & Lennox, 1991). For reflective measures the causality flows from the latent construct to the observable items (MacKenzie et al., 2011), i.e., in the case of liquidity, higher liquidity causes lower bid-ask spreads or higher trading volume on the stock exchanges. This is not feasible for privately held family firms, as bid-ask spreads, trading volumes, or similar reflective measures are not available for rarely-traded companies. In contrast, for formative measures, the causality flows from the observable indicators to the latent construct (Diamantopoulos & Winklhofer, 2001). This creates an opportunity to measure the underlying liquidity – how easily an asset can be sold – without actual trades taking place.

To develop a valid and reliable measure, I follow Diamantopoulos and Winklhofer's (2001) approach of index construction, using four main steps: content specification, indicator specification, indicator collinearity, and external validity. In the first step, I define the underlying nature and dimensions of the construct, to lay the necessary foundation that is highlighted throughout the literature (MacKenzie et al., 2011). In the second step, I specify a set of indicators that represents all aspects of this underlying construct. I structure this procedure in five sub-steps to ensure the reliability of my results. First, I conducted a review of the previous literature. Second, I consulted with academic colleagues in the areas of finance and family business about the theoretical implications of the construct of market liquidity in the context of private firms. Third, I held a first round of interviews, asking practitioners in the field which factors they consider as constituents of market liquidity. Fourth, in a second round of interviews I

presented practitioners and experts in the field of market liquidity with my pool of items, seeking agreement from them on both the completeness and relevance of the pool of items. Finally, I presented this set of items again to a group of nine experts in the family business field and three experts in corporate law of family businesses to ensure its completeness, thereby finalizing the indicator specification. In steps three and four, I collected primary data from 207 German family firms to assess potential problems of multicollinearity and to externally validate my index.

The resulting index is the foundation of my second essay, which aims to analyze the extent to which market liquidity influences the innovation outcomes of family firms. Innovation has been found to be a crucial factor of firm performance (Gopalakrishnan & Damanpour, 1997), growth (Aghion & Howitt, 1992), competitive advantage (Dess & Picken, 2001; Kellermanns, Eddleston, Sarathy, & Murphy, 2012), and long-term firm survival (Baumol, 2004; Cefis & Marsili, 2005, 2006). Consequently, tens of thousands of articles have been published regarding this topic (Crossan & Apaydin, 2010). Similarly, family business research has focused extensively on the topic of innovation, as transgenerational control is only possible with long-term survival of the firm. However, results are often inconclusive about the influence of family control on innovation; a more detailed analysis of the underlying factors of influence is necessary (Duran, Kammerlander, van Essen, & Zellweger, 2015). The finance literature has found liquidity to be an important factor of influence on innovation, with higher liquidity leading to lower levels of innovation in listed corporations (Fang et al., 2014).

Considering this study and the effect that different levels of liquidity might have on the management and shareholders of privately held family firms, I analyze the effect of liquidity on the innovation outcomes of family firms to add insight to yet-inconclusive results on innovation. To do this the second essay employs a multiple regression analysis

to empirically test the hypotheses derived from the theoretical influence of liquidity on communication and lastly on innovation. For this analysis, I collected data by questionnaire from medium-sized German family firms within the mechanical engineering industry. These firms, among the small- and medium-sized enterprises, have a reputation for innovation (Simon, 2009), and are mostly family owned (ZEW & ifm Mannheim, 2009). To obtain the necessary address list, I took two different approaches. To start with, I cooperated with a German “Industrie- und Handelskammer” (IHK; German regional Chambers of Industry) to gain a list of 1839 appropriate firms from all over Germany. I completed this list using the Amadeus database and filtering the list of firms manually for the target group and their family firm status. Eventually I had a hand-selected address list of 1924 companies of the German mechanical engineering industry. From all of these companies, one key informant was contacted with a mail survey. To increase return rates, the questionnaire was accompanied by a personalized, partly-handwritten cover letter and a postage-paid return envelope. As a result, I obtained 126 valid questionnaires that could be included in my analysis. This represents a response rate of nearly 7%, which is not uncommon in the field of family business research when targeting members of the top management team (TMT). Using the data, I run a multiple regression analysis to test the influence of liquidity on open communication between family members and on innovation outcomes. Additionally, I perform two mediation tests to analyze the role of communication between liquidity and innovation. Contrary to the study of Fang et al. (2014) on listed companies, my results show that higher levels of liquidity have a significant positive effect on open communication between family members. This in turn leads to higher innovation outputs even when controlling for innovation investments.

Building on the insights into family firms' specific characteristics with regard to liquidity, I come full circle to apply this knowledge on listed companies. Recent studies of the finance literature have taken family firm status into consideration when analyzing companies' liquidity (e.g., Ali et al., 2007; Chen et al., 2014). One of their main factors of analysis in this regard is the voluntary disclosure of information that can have a significant effect on liquidity levels (Healy & Palepu, 2001). However, previous studies are still inconclusive concerning the influence of family ownership on disclosure and liquidity (Chen et al., 2014). This has led the literature to call for a more detailed analysis of family specific preferences and to account for heterogeneity among family firms (e.g., Gomez-Mejia et al., 2014; Wang, 2006). Essay 3 follows the analysis of the determinants and outcomes of liquidity in privately held family firms in essays 1 and 2. I draw in this paper on the specific characteristics of family owned companies, i.e., their specific ownership structure, long-term orientation, and their focus on non-economic utility like preserving their privacy. To test my resulting hypotheses, I employ multiple regression analyses. As these analyses compare family and non-family firms, I use the sample of all German companies listed on the prime standard of the Frankfurt Stock Exchange. The prime standard represents the largest and most transparent market segment of the Frankfurt Stock Exchange with shares of 323 companies traded in 2015. After controlling for companies with multiple share types, excluding financial institutions and firms with their headquarters outside of Germany, and controlling for missing data and insolvencies, a final sample of 225 prime standard firms is used in my analyses. Data for these analyses were acquired from multiple sources to increase reliability. Financial data concerning the liquidity of firms and their market capitalization were mostly drawn from Datastream. Other firm characteristics were acquired from Deutsche Börse, the operator of the Frankfurt Stock Exchange, and controlled and completed via Amadeus Databank. Finally,

disclosure information was collected manually from the statements and websites of the companies as the most reliable source. The resulting data were used in multiple regression analyses and mediation tests to test my developed hypotheses. Although family firm status and generational differences have significant effects on liquidity and disclosure, the hypothesized mediation effect of disclosure between family firm status and liquidity cannot be shown. Eventually, it seems that ownership structures play a more important role than family firm specific preferences and characteristics with regard to listed and highly transparent companies.

Table 0-1 on the following page summarizes the research methodology, data collection, and theoretical perspectives of the three papers.

Table 0-1: Overview of the three essays in this thesis

	Essay 1	Essay 2	Essay 3
Title	Market liquidity of privately held family firms: The index of family firm liquidity	Innovation in family firms: The influence of market liquidity on communication and innovation outcomes	Market liquidity and disclosure policies of family firms: The influence of generational differences
Research question	How can we measure the market liquidity of privately held family firms?	To what extent does market liquidity of family firms influence their innovation outcomes?	To what extent do family firm status and generational differences among family firms influence the disclosure policies and liquidity of listed companies?
Theoretical foundation	Liquidity literature	Resource-based view (RBV)	Agency theory; socioemotional wealth (SEW)
Methodology	Formative index construction	Regression analysis	Regression analysis
Sample	207 privately held German family firms	126 privately held German family firms	225 listed German family and non-family firms
Data collection	Personal interviews; paper-based survey; mailed questionnaire	Paper-based survey; mailed questionnaire	Secondary data via Datastream, Amadeus Databank, Deutsche Börse; Primary data via the companies' websites
Dependent variable	Not applicable	Innovation outcomes	Liquidity (bid-ask spreads)
Main empirical results	Valid and reliable index of family firm liquidity.	Liquidity has a significantly positive influence on innovation outcomes. This effect is mediated by open communication among family members.	Family firm status significantly lowers the liquidity of listed companies. This effect only exists for first generation family firms. Generational differences have a significant influence on disclosure policies of family firms.
Main theoretical contribution	Introduction of the financial construct liquidity to family firm research. This adds to our understanding about the behavior of family firms in the context of financial structure.	Combining family firm and financial literature broadens our knowledge of the RBV in family firms. This study shows that market liquidity and open communication can represent valuable resources unique to family firms.	This study highlights the importance of incorporating differences among family firms and their specific characteristics into the agency-driven debate. Incorporating SEW preferences of family firms helps to understand inconclusive results of earlier studies and deepens our understanding of the influence of this concept.
Main practical implication	The developed index of family firm liquidity offers family and non-family practitioners a tool to measure the liquidity of a company's shares without taking actual sales into account	Family firm managers have to consider the advantages and disadvantages of liquidity in the light of the findings of this study. Liquidity can be of great advantage as it can improve open communication among family members and thereby increase the firm's innovation outcomes.	Not all disclosure has an effect on the liquidity of firms on regulated markets. Practitioners can reduce corporate governance information disclosure without negative consequences on liquidity.

STRUCTURE OF THIS DISSERTATION

The following sections are structured as follows. Each of the next three chapters contains a conceptually linked, but independent, research essay. I am the sole author of the first two essays, presented in chapters 2 and 3. The third essay (chapter 4) was co-authored together with Junior-Prof. Max Leitterstorf (WHU). The last section, chapter 5, provides a brief summary of the findings and draws some overarching conclusions.

ESSAY 1: Market liquidity of privately held family firms: The Index of family firm liquidity¹

INTRODUCTION

While the field of research into family firms has received growing interest among scholars and practitioners since the early 1990s, the focus has been mainly on non-finance topics such as succession and governance (Chrisman, Chua, & Sharma, 2005). Most studies within family business research that analyze finance topics have concentrated on comparing family firms and non-family firms with respect to their financial performance (e.g., Anderson & Reeb, 2003a; Villalonga & Amit, 2006). The few papers that analyze family firms' financial structure mostly focus on the firms' source of capital (Yu et al., 2012). In this regard, family business research has ignored important aspects that play a crucial role in the mainstream finance literature in understanding the preferences, strategy, and performance of firms. One key aspect is the market liquidity of shares of a company. The financial literature highlights the influence of increased market liquidity on listed companies, for instance as it raises share prices by reducing the required returns of firms (e.g., Amihud & Mendelson, 1986a; Silber, 1991), improves economic growth and increases investments (Henry, 2000; Levine & Zervos, 1998), and influences aspects such as corporate governance, executive compensation, and corporate policies (see Foucault et al., 2013). Considering liquidity of family firms, the construct can have a very special and different influence, as family specific characteristics, such as transgenerational intent (Chrisman et al., 2004; Chua et al., 1999) or non-economic utility (Gomez-Mejia et al., 2007; Gómez & Maícas, 2011; Miller & Le Breton- Miller, 2014) play a pivotal role that has so far not been included in mainstream analyses of liquidity. To understand liquidity

¹ This essay is an unpublished manuscript.

of family firms could therefore not only help to foster our understanding of central topics within family business research, including differences in performance and growth, but also provide feedback to the literature on finance regarding specific characteristics and preferences of shareholder groups.

Because of the many facets of liquidity, but also because of constraints in data availability, different measures of liquidity have been introduced in the past (see Amihud et al., 2005; Foucault et al., 2013; Liu, 2006). In addition to classical measures such as trading volume, the bid-ask spread of listed shares, or market depth (Amihud & Mendelson, 1986b), other measures have been introduced to fit the researched environment and the available data (Foucault et al., 2013). One commonly used measure in recent literature is Amihud's (2002) illiquidity measure, defined as "the monthly average of daily absolute value of return divided by dollar volume" (Korajczyk & Sadka, 2004: 1063). This measure and most of the other ones, including the classical ones, are only applicable with (1) sufficient data about the asset and (2) fairly frequently traded assets. Both (1) and (2) are, however, not always given for family firms. Non-listed family firms are not subject to the same disclosure requirements as publicly listed firms are and often use this right to strictly limit the available data about their firm. Additionally, shares of firms with large blockholdings, especially family blockholdings, are naturally less frequently traded due to their ownership structure (Brockman et al., 2009). Considering these points, it becomes clear that currently employed liquidity measures are not suited to being applied to family firms or other rarely traded assets with little public data available and highlights the importance of a reliable and valid measure that is applicable in these contexts.

The goal of this paper, then, is to provide a measure of liquidity for non-listed family firms' shares. As shown above, conventional methods are not applicable in this case. Therefore I introduce a new way of approaching family firms' liquidity by combining a large set of determining factors into an index that proxies for the firms' liquidity.

The need for a new measure of liquidity for family firms becomes obvious when we consider the following points: a family firm specific measure could explain critical differences in different types of firms in the research of liquidity and thereby enhance the understanding of the effects of liquidity in environments that diverge from the standard case of publicly traded entities. In this regard, Amihud et al. (2005) maintain that where data availability is a problem, substitute measures of liquidity have to be invented. A new measure can add valuable explanations to the ongoing debate about family firms' financial structure, as liquidity plays an important role in investment decisions (Henry, 2000; Levine & Zervos, 1998) and broader contexts of the macroeconomy (Pastor & Stambaugh, 2003). In this regard, advancing the research on family firm liquidity can contribute to building a consistent theory on family firms' financial structure as a whole. Understanding the ability of family business owners to sell their shares will help us to understand their long- and short-term decisions such as risk taking or long-term orientation. Agency problems that are specific for family firms such as "hostage taking" of shareholders through low liquidity, i.e., the notion that family members have no chance to sell their shares to third parties (Schulze et al., 2001), can be further investigated and differentiated between heterogenic family firms. Practical implications allow family firm managers and owners to consider the liquidity of their business's shares and eventually its underlying costs and advantages. This enables practitioners to critically compare their future options, such as succession vs. sale. Furthermore, the topic adds to the

heterogeneity debate (see Chua, Chrisman, Steier, & Rau, 2012; Sharma, Chrisman, & Gersick, 2012) in the field of family firm research by highlighting different approaches of firms to achieve liquidity.

In the next section I give an overview over the field of liquidity, focusing mainly on liquidity measures. This overview will elaborate on the need for an alternative measure of liquidity for rarely traded, especially non-listed family firms. Following this I provide insights into my methodology, the construction of a formative index of family firms' shares' liquidity, and my questionnaire design. After showing my results the discussion, outlook, and conclusion provide the final section of this paper.

LITERATURE OVERVIEW

In this part I provide an overview of the concept of liquidity in the research field of finance, specifically focusing on the need for a new liquidity measure, which constitutes the underlying motivation of this paper.

Market Liquidity

Simply stated, liquidity describes “the ease of trading an asset” (Amihud et al., 2005: 270) and can be defined as “the ability to trade large quantities quickly at low cost with little price impact” (Liu, 2006: 631), or – similarly – as “the ability to trade a security quickly at a price close to its consensus value” (Foucault et al., 2013: 8). These definitions comprise four dimensions: the trading quantity or market depth, the trading speed or immediacy, the direct or explicit trading costs and the price impact. While these descriptions aim for a holistic view of liquidity, most measures focus only on one aspect (Liu, 2006), including the illiquidity measure of Amihud (2002), which employs the dimension of the price impact of liquidity. This represents a possible and widely accepted

way to study the liquidity of frequently traded public shares with the special characteristic of trading on stock exchanges. Trading on stock exchanges typically implies low trading costs, high trading frequencies and many small trades (as a percentage of the company's outstanding shares). In these markets, liquidity is usually provided by market makers who act as intermediary sellers or buyers facilitating trades between third parties for a small premium (Amihud & Mendelson, 1986a). With rising illiquidity through real friction or informational friction (see Stoll, 2000), market makers demand a higher premium which leads to higher bid-ask spreads and therefore higher trading costs for investors. As a result of rising bid-ask spreads, the required returns of an investment rise and the price of the investment decreases (Amihud & Mendelson, 1986a). Privately owned family firms and the trading of their shares differ significantly from these high frequency markets. Even when listing their shares on stock exchanges, family firms pursue different goals and follow different beliefs. Leitterstorf and Rau (2014), e.g., show that family firms are willing to accept higher IPO underpricings than non-family firms to protect their socioemotional wealth². Furthermore, shares of listed family firms show significantly longer holding periods compared to shares of publicly owned companies (Chen et al., 2008). Therefore, a measure of liquidity in family firms needs to be constructed differently in order to account for these firms' special characteristics. Instead of focusing on the actually traded shares of the firm, I emphasize the original and simple meaning of liquidity – the ease of trading an asset or a liquid asset being “an investment that can easily be turned into cash because it can be sold immediately at a competitive market

² For further information about socioemotional wealth see Gomez-Mejia, L. R., Cruz, C., Berrone, P., & De Castro, J. 2011. The bind that ties: Socioemotional wealth preservation in family firms. *The Academy of Management Annals*, 5(1): 653-707, Gomez-Mejia, L. R., Haynes, K. T., Núñez-Nickel, M., Jacobson, K. J., & Moyano-Fuentes, J. 2007. Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly*, 52(1): 106-137.

price” (Berk & DeMarzo, 2007: G-10) – by analyzing the possible tools and provisions that are applied by a firm to reduce or increase the liquidity of its shares. It is important to note that liquidity as perceived by the decision-makers of family firms plays an important role, especially for future decisions. For listed companies even the threat of exit of blockholders effects the management of the company (Bharath, Jayaraman, & Nagar, 2013). Before an effective sale of shares or of the company takes place, perceptions of liquidity influence management decisions and firm characteristics, such as innovativeness (e.g., Fang et al., 2014). Therefore it is not the liquidity on the market, but the ease with which the shares could be sold and how this is perceived by the decision-maker(s) of the family firm that has to be measured.

Market Liquidity of Privately Owned Family Firms

Family firms, especially privately owned ones, differ significantly in their ownership structure and ownership behavior from publicly held, listed companies. Following La Porta et al. (1999), a family firm is defined by at least 20% of the shares being owned by a family or an individual and having at least one member of the family in the TMT; in privately held family firms, these numbers are often much higher. In my sample, the average percentage of voting rights held by the owning family reached almost 90% with no firm family owning less than 25% which represents a blocking minority. With this ownership constellation, the family can effectively impede a sale of the company against its will. Furthermore, not only the ownership structure, but also the ownership behavior of families differs from widespread public ownership. One important characteristic of owning families is to keep control of the company and pass this control on to the next generation (Chua et al., 1999; Chua, Chrisman, & Sharma, 2003; Gomez-Mejia et al., 2011; Zellweger, Kellermanns, Chrisman, & Chua, 2012). This results in prolonged holding periods where trades of shares can be very rare. Therefore, the

reasoning behind the difference between family firm liquidity measures and those of the stock market is that family business shares might be very liquid in the sense that they can be turned into cash easily even though they have not been traded in a very long time because the owners don't want to sell. The idea of liquidity as applied to listed companies – e.g., trading volume, bid-ask spreads – is therefore not the same when it is applied to family firms. The definition of liquidity provided by earlier studies is not applicable when the theoretical liquidity of an asset and its actual trading are not linked to each other.

In this paper I introduce a new way to measure liquidity – a formative index of the liquidity of the shares of family firms. In the next section I show the methodology of my approach from the index construction to the questionnaire design to validate my liquidity index.

INDEX CONSTRUCTION

This section provides an overview over the construction of measures of latent variables. I apply and follow the methodology of formative indices. Therefore, the definition and standards of this methodology are in the focus of the literature overview. Next, the construction of the index of family business is explained. The data collection and the analysis of the collected data to assess the internal and external validity of the factors and the results of these analyses sum up this chapter.

Measurement of Latent Variables

Liquidity is a characteristic of a company's shares that is not directly observable. Unlike other characteristics it has to be deduced from other measurable factors and is therefore a latent variable. Latent variables require measures for the unobservable

construct. The most widely used method for providing such measures is the construction of a reflective scale (MacKenzie et al., 2011). While this method is profoundly researched and highly accepted (Churchill Jr, 1979; MacKenzie et al., 2011) it does not always fit the characteristics of the underlying latent construct (Bollen & Lennox, 1991). In reflective measures causality flows from the latent construct to the measures (MacKenzie et al., 2011). Different levels of liquidity cause differences in its measurement items; higher liquidity for example, can be expressed by higher trading volume or smaller bid-ask spreads (Amihud, 2002; Amihud & Mendelson, 1986a). While these measures work for listed and regularly traded companies, they do not fit for most family firms. Reflective measures either do not exist (privately held firms are not traded on regulated markets, therefore no market makers provide bid-ask spreads for these firms) or have no explanatory power (like trading volume, since just because company shares are not traded does not mean they are not marketable). The alternative therefore is to construct a formative index as a measure of liquidity.

Unlike reflective scales, formative indices are defined by a flow of causality from the indicators to the latent construct (MacCallum & Browne, 1993). Therefore the indicators do not reflect the construct but rather form it. A classic example of a formative measure is socioeconomic status, which is determined (and not reflected) by “education, occupational prestige, income, and neighbourhood” (Bollen & Lennox, 1991: 306; Diamantopoulos & Winklhofer, 2001). Note that a change of the underlying construct does not necessarily lead to a change of all indicators, but if one indicator changes, so will the construct (Diamantopoulos & Winklhofer, 2001). While this difference is very clear for some constructs, others are ambiguous with respect to the direction of causality between indicators and construct. This applies to the latent construct of liquidity. Whereas reflective measures exist and are appropriate for listed companies (e.g., Amihud &

Mendelson, 1986a; Brennan & Subrahmanyam, 1996; Foucault et al., 2013), a combination of formative indicators is the best way to measure liquidity where there are not enough trades to reflect a share's true liquidity. The reasoning behind this approach is that even though we cannot measure a share's liquidity reflectively, there are still underlying factors that determine its liquidity which we can measure. The collection of rules developed by Jarvis, MacKenzie, and Podsakoff (2003) to decide whether a latent construct is reflective or formative further underlines the need to measure liquidity in this context formatively. The "direction of causality [...] from items to construct" is necessary, as no reflective items – that are a result of changing liquidity – are available or measurable. The "changes in the indicators should cause changes in the construct" applies just as "indicators need not be interchangeable" and "indicators are not required to have the same antecedents and consequences" because a wide range of factors that determine an important part of the construct influence liquidity (Jarvis et al., 2003: 203). I can approve these, among all other decision rules for formative models, demonstrating that the construct is formative.

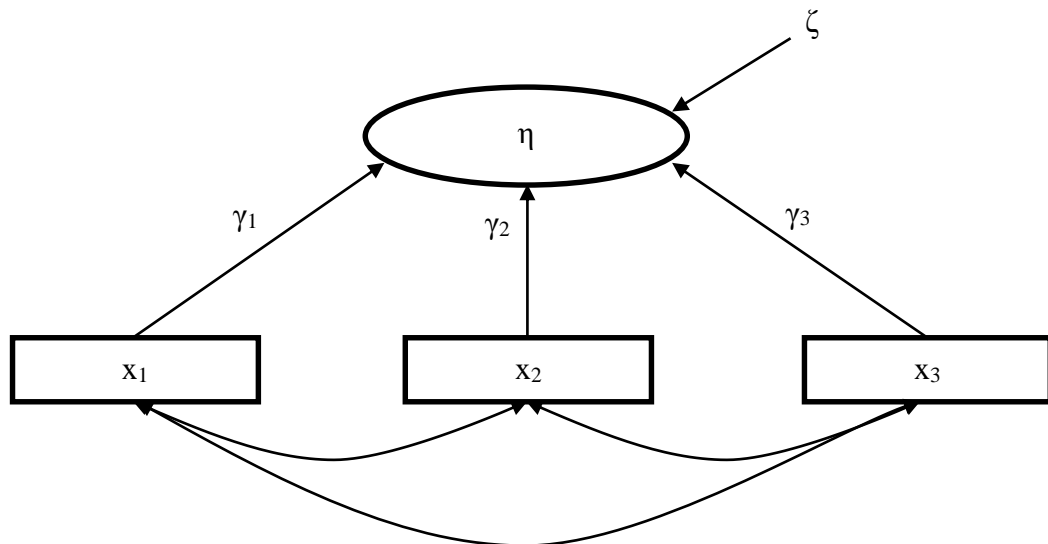
Following Bollen and Lennox (1991), a measurement model with indicators that cause the latent construct (see Figure 1-1) can be shown as:

$$\eta = \gamma_1 x_1 + \gamma_2 x_2 + \dots + \gamma_i x_i + \zeta$$

where η represents the latent variable (i.e., the latent construct), x_i an empirical measure that determines the latent variable (i.e., an observed variable), γ_i a parameter weighting the contribution of x_i to the latent variable η , and ζ the disturbance term. In our case η is the market liquidity of a share of a company and x_i are the observed variables of this company that determine the liquidity of its shares. Whereas items in reflective measurement models are interchangeable (Coltman, Devinney, Midgley, & Venaik,

2008; Diamantopoulos & Winklhofer, 2001), changing or omitting an item gives an incomplete picture of the latent construct (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001; MacKenzie et al., 2011).

Figure 1-1: A formative measurement model



Unlike the scale development process, detailed step-by-step explanations of an index construction are less common (Diamantopoulos & Winklhofer, 2001; MacKenzie et al., 2011). However, four important steps of the process are highlighted: content specification, indicator specification, indicator collinearity, and external validity (Diamantopoulos & Winklhofer, 2001). In the following section I describe these four steps of my index construction process.

Content Specification

The importance of content specification for any development of a measurement model is emphasized throughout the literature (Diamantopoulos & Winklhofer, 2001; MacKenzie et al., 2011). “[D]uring this stage, the researcher should specify the nature of the construct and its conceptual theme in unambiguous terms and in a manner that is

consistent with prior research” (MacKenzie et al., 2011: 298). Failure to do so does not only eventually lead to an undermining of the construct’s internal validity (among other problems), but also endangers reliable results by making it difficult to specify the relationship of the construct and its items and therefore making it difficult to distinguish between formative and reflective constructs (MacKenzie, 2003).

Following MacKenzie et al. (2011), I combine the findings of previous research, interviews with practitioners, and the goal of measuring explicitly family firms’ market liquidity to come up with a clear conceptual definition of my construct. Literature shows various definitions of the construct market liquidity. Most concise, but also nonspecific, is perhaps the definition of Amihud et al. (2005: 270) in their survey of the topic: “Stated simply, liquidity is the ease of trading a security.” In his seminal work, Kyle (1985), building upon Black (1971), describes market liquidity as “a slippery and elusive concept, in part because it encompasses a number of transactional properties of markets. These include "tightness" (the cost of turning around a position over a short period of time), "depth" (the size of an order flow innovation required to change prices a given amount), and "resiliency" (the speed with which prices recover from a random, uninformative shock)” (Kyle, 1985: 1316). Using different words and splitting “tightness” into its components “cost” and “period of time”, Liu (2006: 631) defines the construct in an easily understandable manner: “Liquidity is generally described as the ability to trade large quantities quickly at low cost with little price impact. This description highlights four dimensions to liquidity, namely, trading quantity, trading speed, trading cost, and price impact.” Amihud & Mendelson (1991: 56) state that “[a]n asset is liquid if it can be bought or sold at the current market price quickly and at low cost.” This definition again shows the components “trading speed”, “trading cost”, and the “current market price” which can be seen as a summary of trading quantity and price impact.

Building on these definitions and the underlying criterion of the construct market liquidity – how easily an investment can be turned into cash – I define the following four subcategories as the formative dimensions of market liquidity that are seen adequate by practitioners to represent market liquidity of family firm shares.

Market depth: Describes how much of an asset can be sold at a given point in time and whether demand exists for the firm's shares.

Immediacy: Specifies how quickly an asset can be sold.

Transaction cost: The direct costs of a transaction including brokerage commissions, exchange fees, transaction taxes, legal fees, and costs for corporate valuation

Discount on consensus value: The difference between the achieved price during a quick sale and the consensus value of an asset

The conceptual domain of the construct refers to an outcome comparable to firm performance or share price (see MacKenzie et al., 2011) and the entity to which it applies is the firm (all of its shares). It is important to notice that liquidity is always only measured at a moment in time, as many of its determining factors are subject to constant change, so it offers only momentary information about the firm.

Indicator Specification

Following the definition of the conceptual domain of the construct of liquidity and after pointing out its important role for the context of family businesses, the next step is to specify a set of factors or indicators that represents all aspects of this underlying construct. While reflective measures are generally constructed to use as few indicators as possible, this is not possible with formative measures. As Bollen and Lennox (1991: 308)

state: “With causal indicators we need a census of indicators, not a sample. That is, all indicators that form [the latent variable] should be included.” Omitting an indicator during the construction of a formative measure is changing the underlying construct (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001; MacKenzie et al., 2011). It is therefore necessary to include all indicators that determine the latent variable as it is described in the content specification (Bollen & Lennox, 1991; Diamantopoulos & Winklhofer, 2001).

Following this approach, I consider all indicators that determine market depth, immediacy, transaction costs, and discounts on the consensus value of the shares of a reviewed company. The initial pool of items considered does not differentiate formative from reflective constructs (Diamantopoulos & Siguaaw, 2006; MacKenzie et al., 2011). This pool of items can have many sources (Churchill Jr, 1979; MacKenzie et al., 2011). Considering my index to be a new approach to measuring market liquidity, I structured this procedure in five steps to ensure that the index considers all relevant and available information.

These steps include a review of the relevant literature, the consultation of academic experts in the field, a first round of interviews to add practically relevant factors, a second round of interviews to validate all included factors, and a last discussion round including family business law experts and academic experts to ensure the completeness of my index. The following section describes these five steps in more detail.

In the first step, I conducted a review of the previous literature, extracting all factors that are mentioned to determine market liquidity of non-listed firms. While the literature focused mainly on regulated markets, many aspects seem relevant for privately held family firms. In this step, I noted all factors that are potential factors of influence for

liquidity in family firms. In the second step I consulted academic colleagues in the areas of finance and family businesses about the theoretical implications of the construct of market liquidity in the context of private firms. This led to an initial group of indicators that seem theoretically relevant, mostly taken from the literature on finance, but including family firm specific characteristics. With these indicators as a basis, in the third step I held a first round of interviews, asking practitioners in the field (family firm chief executive officers (CEOs) including some non-family managers) which factors they consider to be constituents of market liquidity. During these first interviews, the participants were only given the definitions of the conceptual domain of market liquidity of private firms. This step together with the first two turns of item generation led to a pool of items to which I continually added over several weeks once they were mentioned in the interviews. During the fourth step, I held a second round of interviews after no additional items were mentioned in the last interviews of the first round. In this round, I presented practitioners and experts in the field of market liquidity with my pool of items to ensure that they agreed on both the completeness and relevance of a pool of 19 items. Lastly, I presented this set of items again to a group of nine experts in the family business area and three experts in corporate law of family businesses. Following this discussion, several items were slightly altered and one item was added until all relevant input was considered in the complete set.

In all five steps, the goal was to collect a census of factors that determine how easily shares of a company can be sold when the owner is willing to sell. The result is a list of 20 factors that might influence the marketability of a family firm's shares: see Table 1-1.

While most of the factors, for instance listed or non-listed or legal form, are very easy to measure with primary or secondary data, others are more complex to capture. Two

of the factors, *bonding of family to the firm* and *asymmetric information*, are highlighted in the following, as both can be important factors of the liquidity of family firm shares but are far from easily observable characteristics.

Bonding of family to the firm represents a factor that was especially emphasized by practitioners. I define this factor as the perceived tie to a firm of the family based on (1) the family's opposition regarding a sale of shares in the perception of the seller and (2) the affection and loyalty that the person willing to sell exhibits regarding his or her family. A high score of perceived refusal of the family to the sale combined with a high score of caring for the opinion of the family by the seller therefore results in a higher perceived bonding of family and firm that will avert the sale. The two underlying constructs (*family reaction to sale* and *importance of family*) are represented by three items each. A factor analysis including nine items was previously conducted to assign the items to their underlying construct. Following this, a weighted sum of the items was computed to get a comparable score for *family reaction to sale* and *importance of family*. Finally, the product of both constructs was taken to represent *bonding of family to the firm*, as a high importance of the family to a shareholder does not restrict a sale when the family does not care about the sale, nor does a high level of opposition to the sale in the family affect any decision when the shareholder does not care about his/her family's opinion.

Table 1-1: Initial set of formative indicators

Determining indicator	Description
Legal form	The legal form of the company (e.g., AG or GmbH in Germany)
Listed/non-listed	Whether shares of the company are listed on a stock exchange
Debt to equity ratio	The relative proportion of shareholders' equity and debt as financial means for the firm
Asymmetric information	A proxy for the information known by the shareholders but not known by potential buyers
Blockholder	Percentage of shares that the biggest blockholder owns
Maximum/minimum ownership	A binding agreement for the shareholders that prevents ownership percentages above or below a certain level
Level of supermajority	The necessary percentage of voting rights to change the bylaws
Divergence of voting rights and shares	The existence of shares with superior voting rights (e.g., dual class system, veto rights)
Number of active shareholders in the business	The number of shareholders (family or not) that are working in the company
Number of active generations	Number of generations of the family working in the company
Number of owners	The number of people that hold shares of the company
Pooling of voting rights	The pooling of voting right shares of more than one shareholder who can only vote unanimously
Fixed price of sale	A fixed price set for a partial sale of shares in absolute or relative terms
Foundation as a shareholder	Ownership of shares of the company by a foundation
Legal restrictions through bylaws	Any bylaws that restrict shareholders from selling their shares (e.g., sale to a third party is forbidden)
Bonding of family to the firm	Perceived tie to a firm of the family based on (1) the family's opposition regarding a sale of shares in the perception of the seller and (2) the affection and loyalty that the person willing to sell exhibits regarding his or her family
Restriction through third party	The sale of shares can be hindered by a third party (e.g., supplier, bank)
Anti-monopoly restrictions	Complications of the sale due to legal restrictions (e.g., anti-monopoly legislation)
Voting rights held by the family	The voting rights of the company that the owning family holds
TMT family percentage	The percentage of family members in the top management team

Asymmetric information describes the difference in knowledge about the company between the shareholders and potential buyers. When the potential buyer has the impression that he/she is uninformed compared to the owners of the company he/she will either insist on external validations (which reduces the speed of the sale and increases direct costs), on a discount on the price (effects the discount on the fair value) or any other

measure to protect him/her from potential harm through information asymmetry (Amihud et al., 2005; Beuselinck, Deloof, & Manigart, 2008). Even though *asymmetric information* is not directly measurable, proxies exist to capture this factor. Two main features of information are important in this context. First, the quality of information has to be significant (Ng, 2011) because only reliable information – in the eye of the potential buyer – will prevent him/her from demanding a discount or external validation. A proxy for information quality in the case of (especially small and medium sized) family businesses³ is auditing. This provides external validity to the disclosed information and therefore heightens its credibility (Allee & Yohn, 2009; Lang & Maffett, 2011). The second important factor to prevent asymmetric information is the quantity of available information. Where information about a firm is not openly available, the potential buyer has to gather information from other sources or make assumptions that are not verifiable. Increased uncertainty raises the need for compensation and therefore reduces liquidity (Amihud et al., 2005; Stoll, 2000). A proxy for the quantity of information – again mainly for non-listed family firms – is the legally required disclosure of the firm depending on its size (German ‘Rechnungslegung nach Größenklassen’) plus voluntarily provided information. Combined, quantity and quality of information account for the factor *asymmetric information*.

³ For large and/or listed firms other proxies have to be used, as the majority (if not all) of the firms will be audited. For a selection of appropriate proxies see, e.g., Lang, M. & Maffett, M. 2011. Transparency and liquidity uncertainty in crisis periods. *Journal of Accounting and Economics*, 52(2): 101-125, Ng, J. 2011. The effect of information quality on liquidity risk. *Journal of Accounting and Economics*, 52(2-3): 126-143.

Data Collection for the Index Validation

To test for indicator collinearity and external validity, I collected data from a sample of 236 firms. In each firm shareholders of German family firms filled out questionnaires comprising the items above. Following a study of the Centre for European Economic Research (ZEW) and the Institute for SME Research and Entrepreneurship (ifm Mannheim) from 2009 with a rather strict definition of family firms (maximum of 3 individuals hold at least 50% of the company's shares) family firms, especially small to medium sized privately held ones are especially numerous and important in Germany, offering perfect conditions for my survey. The questionnaire, which comprises the 20 predictors generated in the indicator specification process, control variables, and a general item that sums up liquidity, was tested for completeness and accuracy in two rounds with family firm researchers, practitioners in the family business field, and legal advisors to family businesses. To get the dataset, the questionnaire was sent in a personalized mailing to 2894 family firms via different German regional Chambers of Industry and Commerce ("Industrie- und Handelskammern" where all companies except for handicraft and agricultural enterprises and freelancers have to be members by law), promising the respondents a copy of the results and a benchmarking as an incentive to participate. The mailing was started in July 2014 with the last round being sent out in April 2015. Several weeks after the main round of mailing, I conducted a follow-up telephone query to increase the response rate. The last questionnaires arrived in June 2015.

Table 1-2: Sample characteristics

Variable	Mean	S. d.	Min.	Max
Respondent age (years)	50.6	10.7	22.0	80.0
Respondent gender (% female)	13,5	0.3	-	-
Family-owned shares (%)	89.6	0.2	0.0 ⁴	100.0
Industry Manufacturing (%)	69.0	0.5	-	-
Industry Retail (%)	10.6	0.3	-	-
Industry Construction (%)	3.4	0.2	-	-
Industry Services (%)	9.1	0.2	-	-
Industry Other (%)	7.9	-	-	-
Firm revenue (in million €)	80.7	335.0	0.2	3580.0
Firm employees (#)	593.9	3712.6	1.0	50279.0

Note: sample characteristics based on n = 207

Eventually these two steps led to a total response rate of 8.15% which is comparable to other surveys that target family firm CEOs in Germany, considering the total length of the questionnaire of 51 items (e.g., Klein, Astrachan, & Smyrnios, 2005; Pieper, Klein, & Jaskiewicz, 2008; Zellweger et al., 2012). Three of the questionnaires were dropped because respondents indicated their company was a non-family firm; another 26 had to be dropped due to excessive missing data. Eventually 207 of the received questionnaires were used in my analysis; details on the respondents' firms are in Table 1-2.

⁴ Although family ownership was reported to be on average almost 90%, the stated family ownership of a few respondents was very low. These cases could be indicated as ones where another branch of the family holds the majority of voting rights. Questionnaires where no family stake of at least 20% could be identified were excluded from my analysis.

Non-Comparable Indicators

While all 20 items were surveyed, some of them turned out to be too specific for an index of market liquidity. Although theoretically determining liquidity, *listed/non-listed*, additional items originally designed to capture other aspects of *asymmetric information*, *maximum/minimum ownership*, *pooling of voting rights*, *foundation as a shareholder*, *fixed price of sale*, *level of supermajority*, *divergence of voting rights and shares*, and the control variables *number of members of advisory board/supervisory board* and *number of family members in advisory board/supervisory board* were reconsidered due to little variance in the responses (see Table 1-3). Some of these factors just seemed inappropriate for this sample of firms, e.g., not one of the companies of the respondents had a foundation as a shareholder. *Foundation as a shareholder* and *listed/non-listed* were not taken into consideration for the further calculation of indicator validity. However, these two items should be controlled for in future studies in accordance with the maxim to never exclude an item without theoretical consideration, as both contain crucial information about a firm's liquidity when applicable. The remaining 13 factors were used for further analyses.

Indicator Collinearity

While multicollinearity is not an issue with reflective constructs, as only simple regressions are conducted, it can pose a problem for formative indices (Diamantopoulos & Winklhofer, 2001). The use of a multiple regression makes it difficult to assess the individual influence of the different items when multicollinearity is high. MacKenzie et al. (2011) follow the previous literature in recommending variance inflation factor (VIF) cut-off levels of 10. Multicollinearity did not pose a problem in my analysis with the highest VIF at 2.89 (blockholder) and a mean VIF of 1.48. Therefore all 13 remaining factors were included in the initial computation.

External Validity

External validity represents the only means by which the fit of the indicators of a formative index can be evaluated. Unlike reflective scales, “the very nature of formative measurement renders an internal consistency perspective inappropriate for assessing the suitability of indicators” (Diamantopoulos & Winklhofer, 2001: 272). As already mentioned, excluding indicators from an index is theoretically controversial, as “[o]mitting an indicator is omitting a part of the construct” (Bollen & Lennox, 1991: 308). However, “from a practical perspective, an excessive number of indicators is undesirable because of both the data collection demands it imposes and the increase in the number of parameters when the construct is embedded within a broader structural model” (Diamantopoulos & Winklhofer, 2001: 272). Balancing these contradicting issues is not an easy task and the literature has yet to come up with a definite way to do it. Most important for the construct of liquidity is that none of the four dimensions of liquidity is lost by deleting items from the index. Additionally, there are crucial factors for companies that do not occur very often (as can be seen in my sample), but cannot be ignored when computing the liquidity of a firm. Diamantopoulos & Winklhofer (2001) note that theoretically no validation is needed for formative indices. However, they highlight three suggestions by which the items of an index should be tested for their external validity. Possible methods to validate an index are (1) multiple indicators and multiple causes (MIMIC) models, (2) linking the construct with other, related constructs, and (3) validating the index by means of a global item representing the underlying idea of the construct. While MIMIC models (following Hauser & Goldberger, 1971; Jöreskog & Goldberger, 1975) and testing the index by linking it with a related construct are good measures of external validity, they are not suitable for my analysis. A MIMIC model requires at least one reflective item that is caused by the latent construct (Jöreskog &

Goldberger, 1975); this is not possible in the case of liquidity of family business shares. As mentioned above, reflective measurements of family firms' liquidity are not feasible unless a sale takes place, which might not be the case for long periods of time in some firms. To connect the index with a related construct is also impractical, as no other construct can be expected to be linked closely enough to the construct of liquidity.

This leaves one option, which is the external validation via a "global item" that can be seen as a summary of the index (Diamantopoulos & Winklhofer, 2001). With this method, a general item that summarizes the underlying construct is included in the questionnaire. The correlations of the possible indicators of the index with this general item are computed. In my study, the global item is "How high do you estimate the general tradability of your shares of your company (indifferent of whether it is on the market or within the circle of other owners)" rated by the respondents on a 7-point Likert Scale. The index indicators are regressed against this item to control for a significant correlation with the underlying idea of liquidity. Following the literature, I drop all items that are not loading significantly on the general item, while always taking theoretical considerations into account (see Table 1-3). I exclude *anti-monopoly restrictions*, *voting rights held by the family*, *legal restrictions through bylaw*, *number of owners*, *debt to equity ratio*, *legal form*, and *asymmetric information*. Although several factors are deleted in this step, the remaining factors still cover the dimensions of the underlying construct.

Table 1-3: Validation of indicators

Determining indicator	Comment
Legal form	Dropped due to low correlation with general item
Listed/non-listed	Dropped due to little variance – should be controlled for
Debt to equity ratio	Dropped due to low correlation with general item
Asymmetric information	Dropped due to low correlation with general item
Blockholder	Used in the final index
Maximum/minimum ownership	Dropped due to little variance
Level of supermajority	Dropped due to little variance
Divergence of voting rights and shares	Dropped due to little variance
Number of active shareholders in the business	Used in the final index
Number of active generations	Used in the final index
Number of owners	Dropped due to low correlation with general item
Pooling of voting rights	Dropped due to little variance
Fixed price of sale	Dropped due to little variance
Foundation as a shareholder	Dropped due to little variance – should be controlled for
Legal restrictions through bylaws	Dropped due to low correlation with general item
Bonding of family to the firm	Used in the final index
Restriction through third party	Used in the final index
Anti-monopoly restrictions	Dropped due to low correlation with general item
Voting rights held by the family	Dropped due to low correlation with general item
TMT family percentage	Used in the final index

Results

After taking into account factor variance, multicollinearity issues, and external validity, six factors remain that form the index of family firm liquidity. *Blockholder* indicates the percentage of shares that the largest shareholder owns. While blockholdership reduces the liquidity of listed companies (e.g., Heflin & Shaw, 2000), the effect is reversed for small non-listed family firms. The more dispersed the ownership of a small company, the more difficult is a sale of the whole company to a third party due to diverging preferences. Additionally, there is little demand for small ownership stakes of privately held firms, as minority shareholders face the risk of expropriation (Chrisman et al., 2004). *Restriction through third party* measures the influence a third party (supplier, bank, customer, etc.) can have on the sale of shares. Logically, the higher the probability

that any third party could intervene in the sale, the lower the liquidity of shares. *TMT family percentage* is the number of family members in the TMT divided by the total number of TMT members. As the family member ratio gets higher, liquidity gets lower, for two reasons. First, more family members on the TMT implies that more persons could potentially lose their jobs once the family business is sold, or they could lose their outstanding position as owner-managers if they sell their shares to other shareholders. Second, more external managers could have a signaling effect of professionalism for outside investors. *Operative owners* indicates the number of shareholders that are also active in the management of the company. Unlike the effect of *TMT family percentage*, this factor positively influences liquidity. While this seems contradictory at first, the two factors are not as similar as they sound. *Operative owners* includes non-family managers that hold shares of the company who have an incentive to keep the shares of the company liquid or even prefer the sale of the whole company, which could lead to a premium on their shares. In contrast to *TMT family percentage*, *operative owners* includes external managers that hold shares of the firm and is also not limited to the TMT.

Bonding of family to the firm is a very special factor in my analysis. As explained in the section indicator specification, *bonding of family to the firm* consists of *family reaction to sale* and *importance of family*. While this factor generally prevents the shareholder from actually selling his or her shares (due to the negative reaction this would cause in his or her family) it is a predictor of high liquidity, i.e., the ability to sell the shares easily, that the shareholder perceives. Last, *number of active generations* indicates how many generations of the family are currently working in the company. Due to changes in a company's structure that usually follow the installation of the next generation in the management, which can raise uncertainty about the firm, this factor reduces liquidity. The regression analysis of these factors on liquidity is in Table 1-4.

Table 1-4: Results of regression analysis for liquidity

Variable	Coefficient	Standard Error
TMT family percentage	-.83*	.36
Bonding of family to the firm	.03***	.01
Restriction through third party	-.25**	.08
Operative owners	.36**	.13
Blockholder	2.21***	.45
Number of active generations	-.44*	.21

N=207; uncentered coefficients are reported;

+ p < .1; * p < .05; ** p < .01; *** p < .001;

Note: Constant term not displayed; results derived from OLS regression with STATA version 13.

The regression on the general item also shows the strength of the predictors on the construct. Using this information I set the formula for the index of family business liquidity as follows⁵:

$$\begin{aligned}
 \text{Liquidity} = & 0.03 \cdot \text{bonding of family to the firm} - 0.83 \cdot \text{TMT family percentage} - 0.25 \cdot \\
 & \text{restriction through third party} - 0.44 \cdot \text{number of active generations} + 0.36 \cdot \text{operative} \\
 & \text{owners} + 2.21 \cdot \text{blockholder}
 \end{aligned}$$

⁵ Note that the difference in strength of the predictors also derives from their underlying values. While *bonding of family to the firm* can take values from 1 to 49, *blockholder* takes only values from 0 to 1.

DISCUSSION AND CONCLUSION

In this paper I develop a measure to analyze the liquidity of family firm shares. Following thorough research of the underlying conceptual domain that defines the construct, I design a formative index that enables future researchers to assess the liquidity of privately held family businesses. Several analyses document the theoretical appropriateness and the internal and external validity of the index's indicators. While market liquidity is an established factor of analysis for listed companies, it has so far not been incorporated into family business research, as it was not measurable for non-listed firms. My liquidity measure contributes therefore to two different areas. First, it provides a new tool for family business research that takes the exit options of family business owners into consideration. This offers the field of family business research a scientifically well-grounded perspective on decisions like the long- and short-term managerial direction as well as changes in ownership of the company's shares that are affected by a potential sale (Schulze, Lubatkin, & Dino, 2003b). Furthermore, family firm researchers have highlighted in various studies the importance of transgenerational control through the family (e.g., Chrisman et al., 2004; Chua et al., 1999; Zellweger et al., 2012). The index of family firm liquidity enables this research stream not only to evaluate the shareholders' orientation towards long-term control, but also their exit options. Future research will have to analyze which part of family firms' long-term orientation is based on a transgenerational intention and which part is due to the lack of an exit option. Additionally, this study provides a basis for future studies that focus on how liquidity of family firms changes agency issues within these companies (Schulze et al., 2003b; Schulze et al., 2001). Especially with regard to the power of passive shareholders, measuring liquidity can provide a factor that determines whether or not non-managing family members get engaged in the firm and control their managing relatives. Similarly, the lack or existence

of exit options can lead shareholders to more or less engagement in the firm, which can represent an important resource for the company (Ward, 2004).

Second, this study broadens the scope of the financial literature on market liquidity. It answers the call to invent new measures where current methods are not applicable (Amihud et al., 2005). This offers a whole new field of study to an area that was so far limited to rather frequently traded companies. Advanced research on non-economic goals of family firms (e.g., Gomez-Mejia et al., 2007) can challenge the mainstream literature's view of shareholders as a uniform group (Chen et al., 2008) that strives for the same goals. Moreover, family firms, with their long-term orientation and transgenerational intent, represent very illiquid assets when applying conventional reflective measures. Taking the construct of liquidity back to its underlying definition allows a more detailed differentiation between liquidity in the sense of actual trades and liquidity in the ability to easily sell an asset when necessary or desirable.

Besides theoretical interest and future research, this index of family firm liquidity offers substantial contributions for practitioners. This study provides a scientifically well-grounded measure that is easily applicable. The measure could provide a starting point from which to analyze family business owners' options concerning a sale, but could also be used as a first tool by legal and business advisors with which to analyze the company's liquidity and thereby understand the management's decisions and assess options for the firm. Another potential use is the assessment of possible takeover targets by competitors or private equity firms, and also the assessment of a possible IPO.

Limitations and Future Research Directions

As this study represents a new development of a measure of family business liquidity, there are some limitations that should be considered in further investigations of

the topic and the use of this index. Due to limited access to data, only information of one representative per family firm (the questionnaire was sent to one managing shareholder of the firm) was collected. Therefore it was not possible to control for different opinions of perceived factors within the family. Subsequent analyses of the construct should ideally address this issue by collecting responses of more shareholders per firm.

Furthermore, this study is cross-sectional. It is important to state that the liquidity of a firm's shares is a changing characteristic. This index offers only a snapshot of this construct that will vary over time, as the underlying factors themselves will change. This, however, makes it possible to examine the effects of changing liquidity on a firm in longitudinal studies. This study focuses on privately held family firms as one group. Future research should assess whether differences in industries, performance, or size influence the strength or significance of the determining factors.

Conclusion

Market liquidity of family firms' shares is a factor that has so far not been taken into consideration when analyzing family firms or privately held firms. The index constructed in this study combines determining factors of liquidity, namely *bonding of family to the firm*, *TMT family percentage*, *restriction through third party*, *number of active generations*, *operative owners*, and *blockholder*. Hence it constitutes a starting point for future research focusing on the influence and outcomes of the liquidity of family firm shares and the resulting implications for performance and strategy.

Link between Essay 1 and Essay 2

By borrowing from the financial literature, I introduce liquidity into the field of family business research. As the introduction and the first essay of this dissertation show, liquidity can represent an important factor for family firms. To analyze the importance of

liquidity in the context of family firms, the second essay focuses on liquidity as an antecedent of innovation outcomes. Due to its crucial role for competitive advantage, performance, and long-term survival of family firms, innovation is the ideal context in which to show the necessity of including liquidity in the analysis of family firms. Essay 1 provides the basis for essay 2 in developing a valid and reliable measure of family firm liquidity. Essay 2 then applies this index in the context of privately held German family firms. The goal of the second essay is to examine to what extent liquidity influences communication and as a result innovation outcomes.

ESSAY 2: Innovation in Family Firms: The Influence of Market Liquidity on Communication and Innovation Outcomes⁶

INTRODUCTION

Innovation is one of the most critical issues that family firms face. Not only can it give a company an advantage over its competitors (Dess & Picken, 2001; Fang et al., 2014; Greve, 2009; Kellermanns et al., 2012; McCann III, Leon-Guerrero, & Haley, 2001), but without innovation the long-term survival – and therefore the possibility of passing on the business to the next generation – is endangered (Ahlstrom, 2010; Kellermanns, Eddleston, Barnett, & Pearson, 2008; Salvato, 2004). The innovativeness of family firms has been compared to non-family firms (e.g., Zahra, Hayton, & Salvato, 2004). Furthermore, the influence of different characteristics of family firms on innovation and entrepreneurship has been analyzed (e.g., Kellermanns et al., 2008; Litz & Kleysen, 2001; Salvato, 2004). Still, research is so far inconclusive about whether family influence has a positive or negative influence on innovation (Duran et al., 2015).

While the influence of various factors on innovation has been tested in family business research, market liquidity as an important factor of the financial structure of family firms has so far not been included in these analyses. Recent financial literature, in contrast, has targeted the effect of market liquidity on a company's innovation. A study by Fang et al. (2014) shows that liquidity impedes the innovativeness of listed companies, measured in patents generated. The authors argue that liquidity increases the risk of hostile takeovers and attracts passive shareholders that fail to control management. The first effect pressures managers to increase short-term profit at the cost of long-term investments while the other reduces control mechanisms that improve long-term

⁶ This essay is an unpublished manuscript.

profitability (Fang et al., 2014). While their paper focuses solely on listed companies and patentable innovations, it highlights the importance of conducting similar analyses for other types of firms. The long-term orientation of family firms (Zahra et al., 2004) poses the question of how market liquidity of shares influences a company's innovation in the context of non-listed family firms, as small changes of innovativeness due to a firm's market liquidity can have severe effects in the long run. This paper therefore investigates the effect of market liquidity of family firm shares on the company's innovation.

This study contributes to the research fields of innovation and family businesses in multiple ways. First, it analyzes liquidity of firms as an antecedent of innovation. I thereby contribute to the ongoing research in understanding the determinants of innovation (Damanpour, 1991), particularly with the special, yet so far little analyzed, characteristics of family businesses (De Massis, Frattini, & Lichtenthaler, 2013; Duran et al., 2015). Taking the RBV (Barney, 1991; Wernerfelt, 1984) as the theoretical framework for this study, I show that liquidity leads to improved communication among family members. Open communication in turn grants a competitive advantage, as it improves a firm's innovation outcomes. This broadens our view on the RBV as it highlights the importance of communication as an intangible resource (see Wernerfelt, 1984). Furthermore, it shows the influence of underlying latent factors such as liquidity that "have the systemic influence of family" (Habbershon & Williams, 1999: 13) on the resource bundle that grants firms a sustained competitive advantage (Barney, 1991). By applying this more nuanced view of potentially influential latent characteristics of family firms, I also add to the heterogeneity debate of family firms (Chua et al., 2012; Sharma et al., 2012). Finally, my work offers practical implications for both the analysis and management of family firms concerning the highly important issue of innovation. Knowing more about the underlying antecedents of innovation enables managers and advisors of family firms to

make well-informed decisions and to balance the reasons for and against one course of action.

To address these challenges, this paper is structured as follows: First, a literature overview introduces the constructs of market liquidity in family firms, communication (resulting from the analysis of liquidity), and innovation; the resulting hypotheses are developed out of the combination of the three fields within the theoretical framework of the RBV. In the following section, I describe the set-up of my survey of liquidity and innovation in the German mechanical engineering industry. I then present the results of my analysis. Finally, I discuss implementation for research and practitioners and sum up this paper by showing its limitations and areas for future research.

LITERATURE OVERVIEW

In this section of my paper, I provide an overview of the literature on market liquidity, communication, and innovation. This leads to the combination of these three lines of research that provide the basis of my model of investigation.

Market liquidity

The market liquidity of a company represents one of the most important constructs to analyze a firm's shares. Simplified, liquidity is "the ease of trading a security" (Amihud et al., 2005: 270). Nevertheless, liquidity is a highly complex latent variable. Another definition states that a liquid asset is "an investment that can easily be turned into cash because it can be sold immediately at a competitive market price" (Berk & DeMarzo, 2007: G-10). Liu (2006) defines liquidity as "the ability to trade large quantities quickly at low cost with little price impact" (2006: 631). Although these definitions are mainly targeted at shares of publicly held companies, the implications for shares of privately held

family firms are inherent. The dimensions that are represented by the construct are the “trading quantity or market depth, the trading speed or immediacy, the direct or explicit trading costs and the price impact” (Röhm, 2016a). For privately held family firms this implies very different levels compared to traded stocks (e.g., Fang et al., 2014) as no market makers are present to facilitate deals. Trading speed is not measured in seconds but rather days if not weeks, months or even years. Trading quantity often implies that especially small percentages of privately held firms cannot be easily sold compared to trading on stock exchanges, where trading large blocks of shares can pose a problem. Explicit trading costs include, e.g., valuations and legal fees, while institutionalized trades on stock exchanges measure trading costs in bid-ask spreads and trading fees that amount to a small percentage of the deal’s value. Finally, the price impact can hardly be compared, as privately held family firms have no stated price per share like listed companies.

All these differences lead to the necessity of using a fitting measure. Frequently used proxies like the illiquidity measure of Amihud (2002) are not applicable due to the non-existence or rarity of actual trades, as many family firms’ shares are not traded in years or even decades, and due to the lack of available data. Conventional measures are simply not applicable to non-listed firms. To assess liquidity of family firm shares, this paper will therefore rely on the liquidity index for family firms introduced by Röhm (2016a). This measure takes into account the special characteristics of family firms and relies on the determining factors of liquidity rather than on conventional measures that analyze the reflective parameters of the construct liquidity⁷. What is important, then, is

⁷ For further explanation of reflective and formative measures see Diamantopoulos, A. & Winklhofer, H. M. 2001. Index construction with formative indicators: An alternative to scale development. *Journal of Marketing Research*, 38(2): 269-277, MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. 2011.

not actual trades but the possibility of selling. While the shares of many family firms are not traded for long periods, the possibility of selling affects the firm, its managers and their decisions (Röhm, 2016a). Compared to firms with very low liquidity, managers and owners of firms with high liquidity face different options and challenges. Discontented owners can sell their shares more easily, forcing the (owner-) managers to attach greater importance to the short-term satisfaction of the shareholders. Therefore, liquidity offers non-managing owners an instrument with which to actively influence decisions within the firm, where they would otherwise be restricted to the role of passive shareholders. Liquidity in family firms is accordingly not only a financial instrument used by anonymous traders, but also an influence on several other aspects of the company. One of the most important and directly affected factors is communication. When shareholders are no longer restricted to a passive role, interest in the firm and its management can be aroused, whether it is to assess the value of one's shares or to influence decisions and therefore the future direction of the firm.

Communication

Studies in the field of family business research have found that among other factors, communication is one of the key criteria that enables the long-term survival of family firms (e.g., Habbershon & Williams, 1999; Ward, 2004). Communication among family members can be crucial for a family firm by giving the company a competitive advantage when its channels are working. Following a definition of Ward (2004: 15) good communication “mean[s] that information, thoughts, and feelings are not only conveyed but also received and understood. It means revealing oneself and being open to others. It

requires trust, vulnerability, and the willingness to raise issues that might lead to disagreement and conflict.” But lack of communication can be devastating. Family researchers see communication as a core aspect of family processes, determining the difference between functional and dysfunctional families (Sciascia, Clinton, Nason, James, & Rivera-Algarin, 2013; Segrin & Flora, 2011). Therefore, a lack of communication cannot just hamper the long-term orientation of family firms by weakening the family function itself (Smith, Freeman, & Zabriskie, 2009) but also impede the advantages that firms have due to family involvement. Open communication within the family plays an important role in creating levels of trust and engagement among shareholders and other family members that lead to family specific resources of a firm (Sundaramurthy, 2008). Habbershon and Williams (1999) see communication as part of the *process capital resources* of a family firm that can earn the company a valuable competitive advantage. The authors define their construct “familiness” “as the unique bundle of resources a particular firm has because of the systems interaction between the family, its individual members, and the business” (Habbershon & Williams, 1999: 11). Failure of communication would mean, among other consequences, information asymmetries and a lack of trust among family members, preventing positive effects of family influence such as patient financial capital, reduced governance costs, or improved human capital (Sirmon & Hitt, 2003). Thus, it is obvious that communication is crucial; without it, all advantages that the family as a group could give to the company are lost. The potential of non-managing family members to be a resource cannot be realized when there is a lack of communication as there are no channels other than communication with their family members to be involved in the firm without an official operative position (Ward, 2004).

Innovation

An “unrestricted search of academic publications using the keyword innovation produces tens of thousands of articles” (Crossan & Apaydin, 2010: 1154). This is not surprising, as it has been argued that innovation is one of the key factors of long-term firm performance and survival (Baumol, 2004; Cefis & Marsili, 2005, 2006; Gopalakrishnan & Damanpour, 1997). Innovation is one of the main drivers of growth (Aghion & Howitt, 1992; Baumol, 2004; Romer, 1986) and increases firm value (Dushnitsky & Lenox, 2006) and firm profitability (Geroski, Machin, & Van Reenen, 1993). Innovation offers firms a competitive advantage (Fang et al., 2014; McCann III et al., 2001; Teece, Pisano, & Shuen, 1997), increases their market share (Zahra & Nielsen, 2002), and gains even more importance in economically challenging times (Boone, 2001). Ahlstrom argues “that the main goal of business is to develop new and innovative products that generate growth and deliver important benefits to an increasingly wide range of the world’s population” (Ahlstrom, 2010: 10).

Research on innovation began in the late 1920s and 1930s when Joseph Schumpeter defined innovation as: “simply the doing of new things or the doing of things that are already being done in a new way” (Schumpeter, 1947: 151). Since then, research has produced various definitions of the construct in order to account for different types of innovation or the level of analysis. However, the literature has not yet agreed on one single definition. Damanpour (1991) defines innovation in his meta-analysis of the construct as follows: “An innovation can be a new product or service, a new production process technology, a new structure or administrative system, or a new plan or program pertaining to organizational members. Thus, innovation is defined as adoption of an internally generated or purchased device, system, policy, program, process, product, or service that is new to the adopting organization. [...] Innovation is a means of changing

an organization, whether as a response to changes in its internal or external environment or as a preemptive action taken to influence an environment” (Damanpour, 1991: 556). In a recent meta-study, Crossan and Apaydin (2010) follow Hansén and Wakonen (1997) in their call to differentiate mere change from innovation by refining this definition. The authors state that “[i]nnovation is: production or adoption, assimilation, and exploitation of a *value-added* [italics added] novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome” (Crossan & Apaydin, 2010: 1155).

Gopalakrishnan and Damanpour’s (1997) review of the subject shows that innovation is a complex construct without a generally accepted definition. They argue that any definition in fact depends on the goal of the respective researcher. Following the authors, any analysis of innovation has to clarify its three dimensions – *type of innovation*, *level of analysis*, and *stage of adoption* – before a definition of the construct that fits the research purpose of the researcher can be obtained (Gopalakrishnan & Damanpour, 1997).

Type of innovation highlights the differentiation of three pairs of aspects: *process* vs. *product*, *radical* vs. *incremental*, and *technical* vs. *administrative*. As the German mechanical engineering industry is especially known for and dependent on its innovations of new *products*, this aspect of innovation type, rather than *processes*, is focused on in this study. A study by Asplund and Sandin (1999) highlights the importance of successful product innovation in the long run, as new product survival influences firm survival itself. Considering the long-term orientation of family firms, it becomes crucial to further analyze the preconditions of product innovation. The literature distinguishes between

radical and *incremental* innovation (Gopalakrishnan & Damanpour, 1997). However, this differentiation will not be taken into account in this study. Both types of innovation show the innovativeness of a company and are therefore analyzed here. To account for the differences between radical and incremental innovation – and to take into account the special importance the literature places on disruptive change for small to medium companies (Baumol, 2004) but also for the whole economy (Ahlstrom, 2010) – the results have been tested in a separate analysis for robustness on radical innovation only. *Technical* vs. *administrative* innovation distinguishes between innovation with regard to “products, processes and technologies used to produce products or [...] services directly related to the basic work activity of an organization” and innovation in regard to the “organizational structure, administrative processes and human resources” (Gopalakrishnan & Damanpour, 1997: 19). Again, my data, collected within the German mechanical engineering industry, imply a focus on technical innovation, which is of high importance to this industry. Summing up, with respect to the *type of innovation* I focus on *products* and *technical innovation*, incorporating both *radical* and *incremental* innovation steps.

Level of analysis differentiates between the four levels of analysis that can be covered when doing research on innovation: *industry*, *organization*, *organizational subunits*, and the *innovation itself*. Building on Crossan and Apaydin (2010), the focus of my study is innovativeness at the organizational level, as liquidity is a construct tied to individual firms. An analysis of nationwide innovation or across industries would prevent any connection between both constructs. The same applies to analyses of lower levels such as innovation of subunits, groups or individuals, as they are all influenced by the overall liquidity of the firm’s shares. Additionally, investigating all different aspects of

innovation in one study would be rather confusing and therefore more harmful to this study than beneficial for the scope of this work.

Stage of adoption is primarily differentiated into *generation of innovation* and *adoption of innovation* (Gopalakrishnan & Damanpour, 1997). While *generation of innovation* represents the stages from idea generation to commercialization of new products or processes, *adoption of innovation* “is viewed as a process of organizational change which directly affects the technical and social systems of an organization” with the two defining stages being initiation and implementation (Gopalakrishnan & Damanpour, 1997: 17). Due to the nature of the organizations analyzed in this study and the previously explained key aspect of their technological products, the focus lies on the generation of innovation that is essential for the examined industry. The aspect of adoption of innovation is explicitly not part of this study.

Finally, Duran et al. (2015) call for a clearer differentiation between innovation input and innovation output when comparing family and non-family firms. Following their analysis, innovation input refers to the financial investment a company dedicates to innovation, while innovation output stands at the end of a long process in the form of new products or patents, among other ideas. With regard to this differentiation, my study focuses on innovation outputs as the eventual driver of superior performance (Kemp, Folkerlinga, De Jong, & Wubben, 2003) and long-term success (Ahlstrom, 2010). Innovation input is included in my analysis as it has been argued to show a strong influence on innovation output (Duran et al., 2015).

According to these differentiations, the focus of my work is close to technological innovation as defined by De Massis et al. (2013) following Freeman (1976): “the set of

activities through which a firm conceives, designs, manufactures, and introduces a new product, technology, system, or technique” (De Massis et al., 2013: 10).

Following the previous literature and the focus of this study on the connection between liquidity and innovation within the German mechanical engineering industry, the definition of innovation used in my paper is as follows:

Innovation is the combination of factors that together generate an incrementally or radically new and valuable technical product from the idea to its commercialization within one firm.

This definition is explicitly narrow, especially compared to the holistic definitions of Crossan and Apaydin (2010) or Damanpour (1991). While this is a limitation to my work, because a generalization of the results is therefore not indisputable, the benefits of this tight definition outweigh its drawbacks. Liquidity, as already argued, is a construct that characterizes shares of one firm. The focus on the organizational level is therefore necessary to gain insight regarding the combination of my two core constructs. Furthermore, the limitation of scope on the generation of technological products is due to the nature of the analyzed industry. While these aspects represent the most important features of innovation in the mechanical engineering industry, they only stand for the general willingness and ability of a firm to innovate, which are the core issues of investigation in my work.

HYPOTHESES DEVELOPMENT

Building on the reviewed literature and the theoretical foundation of the RBV, I develop the resulting hypotheses in this section of my article. First, I analyze the effect of liquidity on innovation. Second, I explore the influence of communication on innovation.

And third, I discuss the mediating role of communication between liquidity and innovation.

Liquidity and Innovation

Liquidity and innovation are in many aspects linked. A higher liquidity of a company's shares gives the shareholders the option of an easy exit. Fang et al. (2014) show that liquidity has a strongly negative effect on innovation in public firms. By analyzing exogenous shocks the authors demonstrate that the cause for this runs from liquidity to innovation for two reasons. First, public firms face the threat of hostile takeovers when the stock liquidity of the company is high. This can lead to reduced long-term investments in order to increase short-term profits and therefore prevent opportunities for takeovers (Fang et al., 2014). Indeed, Graham, Harvey, and Rajgopal (2005) support this expected myopic behavior in their analysis of financial executives when these executives are confronted with short-term performance pressure. The authors show in their study, e.g., that positive net present value projects would not be conducted by the majority of the executives in order to meet the consensus earnings forecast of the current quarter. Second, higher liquidity leads to more passive investors who prefer to follow short-term profits by trading frequently instead of controlling the management of a company. This again pushes managers to cut down long-term investments in favor of short-term profits (Fang et al., 2014).

However, these results for publicly (and frequently) traded firms are not directly transferable to family firms: the influence of the family enables privately-held family firms to act independently of the short-term control of capital markets (Carney, 2005). Hostile takeovers, for example, are normally not possible in family firms, as the

blockholding family members can prevent the sale of a controlling part of shares⁸. Also, family firm shares are on average not frequently traded, especially not by passive profit-seeking investors. Still, family firms can be especially reluctant to engage in innovation, as it is costly and includes high uncertainty and risk. Indeed, unsuccessful product innovation can be a major risk for survival of companies, especially for small and young enterprises (Asplund & Sandin, 1999). This can be of crucial interest to family firm owner-managers, as they not only risk their position in the company as their counterparts in public firms do, but also risk a substantial part of their wealth which is closely tied to the firm (Gomez-Mejia et al., 2007). Research on the influence of family control on a company's innovation has shown contradictory results and is still inconclusive (Carnes & Ireland, 2013; De Massis et al., 2013). While some researchers argue that the family influence can present a unique resource for the firm and can increase innovation (e.g., Kellermanns et al., 2008), others claim that family firms are less likely to foster innovation as a result of the overlap between management and owners (e.g., Block, 2012). In response to this polarization between studies, the recent literature has increasingly analyzed family firms as a heterogenic group with crucial differences concerning their innovativeness (Chrisman & Patel, 2012; Duran et al., 2015; Kellermanns et al., 2012).

Even though liquidity has been shown to impede innovation in publicly traded companies (Fang et al., 2014), the effect on innovation in family firms has to be analyzed from a different perspective. While public firms are led by their management, whose members act myopically when confronted with the threat of hostile takeovers or the pressure of institutional investors (Fang et al., 2014), liquidity may have the opposite effect on family firms. Family firms are, among other factors, characterized by the strong

⁸ There are notable exceptions that, however, do not represent the standard situation in family firms.

influence the family has on the management, either as owner-managers or by directly appointing external managers as the main shareholders (Pieper & Klein, 2007). Furthermore, research on family businesses has found the influence of the family to be a valuable resource for the firm. Building on the RBV (Barney, 1991; Wernerfelt, 1984), some researchers analyze the value of family influence on the firm (e.g., Habbershon & Williams, 1999; Sirmon & Hitt, 2003). Therefore, it is not the implications of liquidity on the management, but rather on the owning family that should be explored, as it is the involvement of the family members as a resource that creates an advantage over public firms (Habbershon & Williams, 1999). The advantage might comprise firm-specific tacit knowledge or structures based on trust and family bounds (Sirmon & Hitt, 2003). The relevant question is therefore how higher or lower liquidity of shares affects the family.

The direct effect of high liquidity could be that family shareholders that are not bound to the firm, because they have no personal stake (e.g., operative involvement) in it, and/or have no socioemotional wealth attached to the firm (Gomez-Mejia et al., 2007) would sell their shares. In firms with low liquidity, in contrast, uninterested shareholders face more problems selling their shares, resulting in a higher probability of them keeping their shares, even though they are neither interested in the firm nor have the possibility of implementing change in the firm without an official operative position. Going one step further, one can also argue that even the possibility of a sale increases the interest in the family business in order to analyze the value of one's shares or only because the ownership of shares is not perceived as an unchangeable fact. Even more, the management might be willing to keep the shareholders from selling their shares and therefore has to keep them attached to the firm by emotionally and functionally involving them. With higher liquidity of their shares, "passive" shareholders also have the ability to enforce their involvement by threatening to demand liquidation of their shares in

financially difficult times or even sell their shares to outside investors or competitors. In addition to the increased possibility of involvement for the non-active shareholders, the possibility of selling their shares should also greatly increase the incentives to actively improve the firm, especially regarding aspects that determine the value of their shares in the future. In any case, high liquidity increases the likelihood of (the remaining) shareholders being interested in the company, while low liquidity might leave the company with more passive shareholders who are also more ignorant. Heightened involvement of family members can be a valuable resource to the firm by providing a bigger talent pool and adding potential knowledge and creativity. If, therefore, higher liquidity leads to more active involvement and interest of family members in the company, I expect that:

Hypothesis 1: Higher liquidity of shares of family firms leads to increased innovation outcomes within these companies.

Open Communication and Innovation

Communication between family members is one of the most important drivers of distinctive competitive advantages that family firms have. The literature has found various resources that are specific to family firms and grant them benefits over other firms (e.g., Habbershon & Williams, 1999). But whether a company outperforms due to the patient financial capital that its family members invest long-term without the threat of liquidation, the tacit, firm-specific knowledge some family members possess, or reduced costs of governance due to trusted relationships among relatives (Sirmon & Hitt, 2003), a lack of communication would destroy all of these advantages. Trust is built on communication (e.g., Lau & Cobb, 2010; Sundaramurthy, 2008), without which governance costs rise and long-term financing is uncertain. Also, firm- or industry-

specific knowledge can only provide a sustainable advantage if communication allows making use of it within the firm and handing it on to the next generation in time.

Following this line of argument, innovation is significantly influenced by communication. Open communication allows for a long-term orientation of family firms due to available financial means and strong trust among family members and therefore promotes their innovativeness. Firm- or industry-specific knowledge also enables family members to boost innovation outcomes where other managers lack the insight and experience. A lack of communication, however, again prevents this advantage in innovation from becoming sustainable, as knowledge is not shared or passed on. Furthermore, dysfunctional characteristics of the family such as poor communication can carry over to the firm (Arregle, Hitt, Sirmon, & Very, 2007), not only causing negative effects on family resources, but also on non-family resources that the family needs to foster innovation.

The opposite holds true as well. High levels of open communication among the family influence the climate within the firm, thereby increasing innovation. The extraordinary importance of communication in family firms is further highlighted when one takes the special characteristics of the family influence on the firm into account. Pieper and Klein (2007) show in their model of family firm systems that various interests have to be managed simultaneously within the firm and family in order to permit the functioning of the system “family firm” as a whole. The authors differentiate between the *family system*, the *ownership system*, the *management system*, the *business system*, and the *individual* in the middle of the whole model, all being connected by the family members and their ability to communicate (Pieper & Klein, 2007). Therefore, only functioning communication channels between the different systems enable the firm to

provide resources for innovation development (*family system, ownership system, individual*) and to successfully implement and exploit their innovations (*management system, business system*).

In addition to these indirect effects, communication presents an important direct effect on innovation. Including all family members in strategic discussions, even those not involved in the family business as shareholders or managers, grants the family firm a significantly wider pool of creativity and ideas and challenges outdated beliefs that would otherwise prevent innovation (Ward, 2004). Communication therefore represents a resources in itself but also acts as an antecedent without which several other resources that grant a competitive advantage to family firms, forming the construct of “familiness” (Habbershon & Williams, 1999; Sirmon & Hitt, 2003), have no value. Taking into account the direct and indirect effects of communication on innovation, I expect in summary that:

Hypothesis 2: Open communication among family members has a positive effect on innovation outcomes in family firms.

The Mediation Effect of Communication on the Effect of Liquidity on Innovation

Following my argumentation of the effect of liquidity on innovation, it becomes clear that the expected positive influence of liquidity on innovation outcomes does not originate from the mere fact that shares can be sold more easily. Rather an indirect and psychological effect of share liquidity on family members has to be taken into consideration. This suggests that one or more variables would act as mediators between liquidity and innovation. Mediation is defined as “how, or by what means, an independent variable (X) affects a dependent variable (Y) through one or more potential intervening variables, or mediators (M)” (Preacher & Hayes, 2008: 879) Indeed, the main effect that

higher liquidity should have on family members is an increase in their open communication. As long as family shareholders cannot sell their shares even if they want to, the dominating family members or family managers may have lower incentives to integrate their relatives into strategic discussions regarding the firm. Conversely, higher levels of liquidity force the dominant members to actively involve their relatives in all processes of the firm, to keep them informed and interested in the business if they do not want their shares sold. Additionally, the possibility of selling their shares incentivizes shareholders to learn more about their company, to communicate with their managing family members or even non-family members, and to involve themselves in decisions that determine the future value of their shares. Especially when it comes to non-managing family members, this greatly increases open communication within the family, as the discussion with their relatives (and sometimes external managers) is a way to influence the course of their business in their interest. Finally, although the *possibility* of selling their shares is given, this does not mean that family members actually sell their shares. Active participation within and concern for the firm also increases psychological ownership, i.e., the *feeling* of ownership (Pierce, Kostova, & Dirks, 2001), which can prevent a sale. In their analysis of preconditions of psychological ownership Pierce, O'Driscoll, and Coghlan (2004) show that the level of control individuals experience over their job or work environment positively affects their psychological ownership of their job and organization. Following this argument, higher liquidity would grant family shareholders, as argued above, more experience in control of their company and would therefore increase their psychological ownership of the firm. Additionally, the literature has found that experience of control over the firm leads to increased socioemotional wealth attached to the firm by family members (Gomez-Mejia et al., 2007; Gomez-Mejia, Makri, & Kintana, 2010; Zellweger & Astrachan, 2008; Zellweger et al., 2012).

Both effects decrease the likelihood of selling one's shares and increase the motivation to get involved and improve one's family firm, which again depends on functioning communication channels.

Summing up, I expect the effect of liquidity on innovation to be indirect and mediated by communication. The influencing effects take place in a sequence. First, higher levels of liquidity lead to more open communication within the family. Second, open communication leads to higher innovativeness of the family firm. Following this argument, when communication is incorporated into my analysis, I expect the effect of liquidity on innovation to diminish in significance. This leads to my third hypothesis:

Hypothesis 3: Open communication mediates between the liquidity of shares of a family firm and its innovation outcomes.

METHODOLOGY

In this section I present the methodology of this paper, including the collection of data, the sample, the variables used to test my hypotheses and control their robustness, and finally the analytical method used.

Sample and Data Collection

To test my hypotheses, I collected data by questionnaire from medium-sized German family firms in the mechanical engineering industry. I chose this area for three reasons. First, family firms are especially numerous and important in Germany. The Centre for European Economic Research (ZEW) and the Institute for SME Research and Entrepreneurship (ifm Mannheim) conducted a study in 2009 with a rather strict definition of family firms (maximum 3 individuals hold at least 50% of the company's shares). It showed that 93% of all German companies are family firms, employing 54%

of all German employees (ZEW & ifm Mannheim, 2009). This yields a large number of firms that are of interest to my project, which is necessary to get a sufficiently high number of responses, as family entrepreneurs are especially reluctant to disclose sensitive data about their companies. Second, the German “Mittelstand” (small and medium-sized enterprises) is known for its innovative firms, many of them world leaders in their respective niches (Simon, 2009), making it more interesting for me to analyze their characteristics. Third, analyzing only one industry increases the comparability of the innovation outcomes of firms, thereby improving the quality of my results. To obtain the necessary address list, I took two different approaches. To start with, I contacted a German “Industrie- und Handelskammer” (IHK; German regional Chambers of Industry and Commerce where all companies except for handicraft and agricultural enterprises and freelancers have to be members by law) and got a list of 1839 firms from all over Germany. Selection criteria were size (more than 50 employees), legal form (GmbH, GmbH & Co. KG, and KG, as most family firms that are of interest to my project are organized in these forms), and of course the industry they operate in (mechanical engineering). I obtained a sample of firms similar to each other in various ways, simplifying later comparisons. To assure a holistic sample, I also used the Amadeus database, which lists all corporate organizations in Germany with the same criteria as the ones of the sample I obtained from the IHK, and ended up with a second address list of 2725 companies. Following this first step of listing all German companies matching my criteria, I filtered them manually. In order to send my questionnaire only to my target group (members of the entrepreneurial family of a company), I checked all listed companies via Amadeus, Dafne, and their homepages for three factors. First, I verified that the firm is still operative. Second, I checked whether the firm is a family firm by following La Porta et al. (1999), who define a family firm as a firm where 20% of the

voting rights are held by the founder or one family and one or more family members are in the TMT of the company. Within my sample, the owning family holds on average 96% of the voting rights. Third, I determined the appropriate addressee for all companies to ensure that the right person (member of the entrepreneurial family, mostly manager of the firm, otherwise non-operative shareholder) would receive the questionnaire and to avoid low response rates due to impersonal letters. Eventually I attained a hand-selected address list of 1924 companies of the German mechanical engineering industry.

Next, I took all possible steps to increase the response rate of the project. The addressees were contacted by personalized letters, consisting of a professionally designed envelope, cover letter, questionnaire, voucher for a report of our study including a benchmarking of the industry, and a prepaid reply envelope. The salutation of the cover letter was handwritten and the letter was signed by the project participants to increase the perceived personalization. In the letter, I explained my focus on family-firm topics and innovation of German mechanical engineering companies, thus ensuring that the addressees felt directly addressed and not part of a general study without any link to their business. This ensured that in addition to the afore-mentioned criteria the participants felt addressed correctly as "family firms". To further encourage the recipients' reply, I offered a report of my study including a benchmarking of the industry. Furthermore, I kept the length of my questionnaire to a minimum of four pages and highlighted in the cover letter that the completion would only take (a previously tested) seven minutes. Addressing the general reluctance of family firm owners to disclose any data about their companies, I also highlighted the absolute confidentiality and anonymity of all responses.

The questionnaire itself was tested in multiple rounds to assure completeness, accuracy, and conciseness. Following an internal refinement process, I passed the

questionnaire among various practitioners and academic experts, to ensure scientific correctness and completeness as well as practicality and comprehensibility. Eventually, I attained a very concise, professionally-designed questionnaire containing 64 items to be completed by test subjects (CEOs of family firms) within six to seven minutes.

Like similar recent papers (e.g., Kammerlander, Burger, Fust, & Fueglistaller, 2015), my study is in large part built upon data provided by the family CEOs of the addressed companies. Eventually, 132 firms responded to my questionnaire, representing a response rate of 6.9%. Taking into consideration the sensitive topics asked about in the questionnaire (and the unfortunately simultaneous survey of innovation behavior conducted by the German Federal Ministry of Education and Research (BMBF), Eurostat, and the European Union), this rather low response rate can be compared to similar recent studies (e.g., Kraiczy, Hack, & Kellermanns, 2015). In order to exclude small firms that might show different characteristics, especially concerning the liquidity of their shares, companies with fewer than 50 employees (defined by the European Union as small firms) were excluded from the analysis. Thus the final sample consists of 126 firms. Sample characteristics can be seen in Table 2-1.

Table 2-1: Sample characteristics

Variable	Mean	S. d.	Min.	Max
Respondent age (years)	50.2	12.0	22.0	80.0
Respondent gender (% female)	12.7	0.3	-	-
Voting rights of the family (%)	96.0	11.5	40	100
Equity ratio (%)	50.1	20.6	0.1	100
Firm revenue (in million €)	51.3	107.3	4.6	1106.0
Firm employees (#)	274.1	499.1	50.0	5098.0
Firm age (years)	64.1	46.3	2.0	315.0

Note: sample characteristics based on n = 126

Measures

Dependent variable

The dependent variable in my analysis is innovation. To measure innovation, the previous literature has focused on two different characteristics of innovation, namely innovation input and innovation output (Duran et al., 2015). Innovation input, or the willingness and determination to foster innovation in the form of, for example, R&D investments has been used by multiple studies analyzing innovation of family firms (e.g., Block, Miller, Jaskiewicz, & Spiegel, 2013; Block, 2012; Chrisman & Patel, 2012). Similarly, innovation output in the form of economic success of newly invented products has regularly been at the heart of studies that analyze innovation in family firms (e.g., Cassiman & Veugelers, 2006; Laursen & Salter, 2006; Mihalache, Jansen, Van Den Bosch, & Volberda, 2012). In this study, I follow the latter approach and focus on innovation output of family firms. Innovation outcomes can be generally measured as the current innovativeness of the firm, rated by a manager or owner of the firm. Following

the definition of innovation used in my study, this approach is well suited to my analysis, as it incorporates all relevant aspects of innovation that might be influenced by liquidity or communication. The four-item scale from Mihalache et al. (2012) adapted from Li and Atuahene-Gima (2002) is used to assess the firms general innovativeness. Its items – “we introduced in the market many products and services that are completely new to us”, “our firm has launched several new lines of products”, “our firm places emphasis on product and process innovation”, and “we often experiment in the market with new products and services” – were translated into German and validated. A 7-point Likert scale with possible responses ranging from 1 (strongly disagree) to 7 (strongly agree) was employed to measure the items. Additionally, a two-item scale was adopted from Hsu and Chang (2011) to validate the results for radical innovation. Again, the two items “our firm has made many dramatic changes in its products and services over the past three years” and “over the past three years, our firm has emphasized making major innovation in its products and services” were translated into German, validated, and measured on a 7-point Likert scale. (Please refer to the appendix to see these results.) *R&D investments* as a measure of innovation input was used as a control variable. *Turnover generated by new products* represents another way to measure innovation output and can be used as a validation of the subjective scale (Mihalache et al., 2012). The strong correlation of this measure with the scale used in the main analysis ($r = 0.516, p < 0.01$) indicates the latter’s validity. Please refer to the appendix for the results of a separate analysis, including *turnover generated by new products* as the dependent variable.

Independent variable

Share liquidity of family firms has been measured by applying an index constructed in my previous analysis of liquidity of family firm shares (Röhm, 2016a). It combines 6 items – *family bonding to the firm, restriction through third party, generations operative,*

TMT family percentage, blockholder, and operational owners – that were found to influence the liquidity of family firms' shares into the *index of family firm liquidity*. An additional item that assesses the general liquidity of the respondents' shares was conducted to validate the results of the index. The results of this robustness check can be seen in the appendix. Even though it would be more convenient to use only this general item, this would create serious problems of endogeneity, as the level of innovation of a firm could influence the perception of the liquidity of shares that a shareholder has. Measuring liquidity with the index allows me to draw conclusions about the effective direction, as the combined items are stable formative indicators that are not subject to variations, unlike the subjective perception of liquidity.

Mediator variable

Open communication has been measured following the scale of Cabrera-Suárez, Déniz-Déniz, and Martín-Santana (2014) that was adopted from Björnberg and Nicholson (2007). The four items pose the question of consent: *in this family we openly express our opinions, in this family we regularly talk about things that concern us, in this family we take time to listen to each other, and in this family we bring issues out in the open, good or bad*. The scale was translated into German, validated, and measured on a 7-point Likert scale with possible responses ranging from 1 (strongly disagree) to 7 (strongly agree).

Control variables

In addition to the variables used to test the hypotheses proposed above, I also control for other factors that were shown to have an influence on innovation. As innovation can be influenced by economies of scale and therefore size effects (Block et al., 2013; Hansen, 1992), I control for firm size by including the number of employees and the turnover of the company. Due to their skewness, I use the natural logarithm of

both variables (compare e.g., Chen & Hsu, 2009; Chrisman & Patel, 2012; Hsu & Chang, 2011). Earlier literature also suggests an effect of debt levels on innovation (Czarnitzki & Kraft, 2009), so the equity-to-assets rate is included as a control variable. Further, I control for the age of the firm and the generational stage due to possible entrenchment that could limit the willingness to innovate (Chrisman & Patel, 2012). The natural logarithm is used of age of the firm to account for its skewness. Legal form is included as a variable to control for differences due to the organization of ownership of the firm. As I only analyze one industry (mechanical engineering), controlling for industries as suggested in the literature is not necessary. *R&D investments*, defined as spending on research and development of new products divided by the turnover (averaged over the last three years to account for the time lag of these investments), is included as a control variable in order to incorporate the effect of higher initial spending on innovation. Due to its skewness, I use its natural logarithm in my regression. Finally, respondents' age and gender are included to control for differences in the responses due to the subjectivity of the inquired constructs.

Common method bias

Common method bias, a bias based on the simultaneous questioning of the dependent and independent variables, is a potential problem of my analysis because of the nature of my data collection. It was neither possible to obtain dependent and independent variables from different sources nor feasible to measure these variables in different contexts. I therefore followed the recommendations of the literature (e.g., Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) to ensure that no common method bias impaired my analysis. Ex ante I made provisions to prevent respondents from adjusting criterion and predictor variables by guaranteeing anonymity, separating criterion and predictor variables psychologically, and any other remedies possible within the

questionnaire design (Podsakoff et al., 2003). To account ex post for a potential common method bias in my collected data, I conducted an explanatory factor analysis to analyze the relationships among my measured items (Hair, 2010; Podsakoff et al., 2003). Following the literature, common method bias is likely when "either (a) a single factor will emerge from the factor analysis, or (b) one "general" factor will account for the majority of the covariance in the independent and criterion variables" (Podsakoff & Organ, 1986: 536). For this analysis, all items and sub items of the full model were entered into a factor analysis. The results show five factors with Eigenvalues above one, accounting for a total of 87.9% of the covariance. The largest factor accounts for 41.3% of the covariance. Hence, this factor does not account for the majority of the variance. Furthermore, I conducted a confirmatory factor analysis to ensure that there was no one common factor. Following, e.g., Podsakoff et al. (2003), I first built a trait model that loaded all independent, dependent, and mediator items on their theoretically appropriate construct⁹. RMSEA and SRMR as goodness of fit indicators are below .1, indicating a good model fit (Steenkamp & Baumgartner, 1998). CFI and TLI are above the acceptance level of .9 and therefore confirm the model's good fit (Steenkamp & Baumgartner, 1998). Next, I built a method model, loading all independent, dependent, and mediator items on one general underlying construct. RMSEA and SRMR values above .1 and CFI and TLI values well below .9 show that the single-factor model does not fit the data well. Detailed information is in Table 2-2. Following both the explanatory factor analysis and the confirmatory factor analysis I can conclude that there is no single dominant factor in my

⁹ Please note that two items were not included in the confirmatory factor analysis due to their misfitting variable type.

analysis. Therefore, common method bias is likely no concern and unlikely to impair the interpretation of my results.

Table 2-2: Confirmatory factor analyses

Measure	Trait model	Method model
RMSEA	.083	.160
SRMR	.055	.101
CFI	.952	.813
TLI	.938	.772

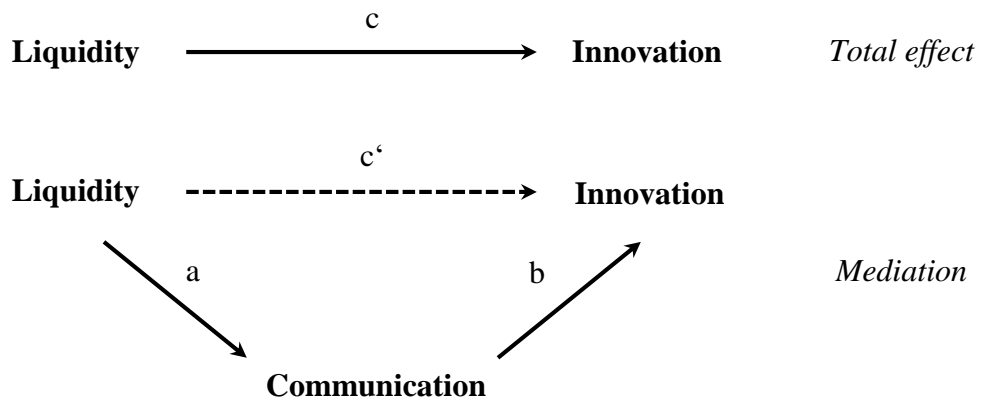
Analysis

Multiple hierarchical regression analysis was used to test my hypotheses, whereby the regression model is rolled out step-by-step, including the independent variables, in a pre-specified sequence. Following examples from the literature (e.g., Cohen, Cohen, West, & Aiken, 2013), I first calculated a base model that includes only the control variables. Next, as Figure 2-1 shows, the predicting variable liquidity was included to test for its total effect (c) on innovation. Open communication was then included to test for its mediating role. Following Baron and Kenny (1986) and recent literature related to my study (e.g., Gómez & Maícas, 2011) I tested the mediating role of communication between liquidity and innovation in four steps, as this causal-steps strategy is the most commonly used method (Preacher & Hayes, 2008). The first step is already conducted by testing the total effect of liquidity on innovation (c). The second step regresses the mediator on the independent variable, testing the effect of liquidity on communication (a). The third step regresses the dependent variable on both the mediator and the independent variable therefore conducting the full model, including control variables, liquidity, and communication to test for the relation of communication to innovation (b) while the

independent variable liquidity is held constant. The fourth step tests for the mediation effect by assessing the difference of the total effect (c) of liquidity on innovation without communication and the effect of liquidity when including the mediation variable (c') (Shrout & Bolger, 2002).

Additionally, a Sobel-Goodman mediation test between liquidity, open communication, and innovation was conducted to calculate the strength of the direct effect of liquidity on innovation and the indirect effect of liquidity via communication on innovation (Goodman, 1960; Preacher & Hayes, 2008; Sobel, 1982). As the literature has criticized the use of the Sobel-Goodman mediation test for small samples (e.g., Shrout & Bolger, 2002), bootstrapping was used to enhance the quality of my results (Bollen & Stine, 1990; Preacher & Hayes, 2008; Shrout & Bolger, 2002).

Figure 2-1: Path models of liquidity on innovation



As the estimation method to fit my model, I relied on ordinary least squares (OLS) estimations. Assuming constant standard deviations of the error terms across all independent variables, i.e., homoscedasticity, is essential for an OLS regression (Hair, 2010). To test for potential heteroscedasticity, I performed the Breusch-Pagan/Cook-Weisberg test and the White test on my full regression model. According to the Breusch-

Pagan/Cook-Weisberg test, heteroscedasticity can be rejected ($\chi^2 (1) = 0.01, p > \chi^2 = .9050$). Equally, the White test supports the assumption of homoscedasticity ($\chi^2 (76) = 86.69, p > \chi^2 = .1887$).

RESULTS

In this section, I first present the descriptive statistics and correlations. Second, I show the results of the control model, not including any independent variables. Third, I analyze the effect of liquidity on innovation in addition to the effect the control variables have. Fourth, I present the suggested mediation effect of open communication between liquidity and innovation. Fifth, I end this section with a summary of the additional tests of robustness and validation that I conducted.

Descriptive Statistics and Correlations

Table 2-3 describes the means, standard deviations, and correlations of all control, independent and dependent variables. Apart from the control variable *R&D investments*, only the independent variable liquidity and the mediator open communication show highly significant and positive relationships with the dependent variable innovation.

To account for potential issues of multicollinearity, I calculate the variance inflation factors (VIF) for my measures. To incorporate only relevant multicollinearity, standardized variables were used. With a highest VIF of 6.05 (turnover) and a mean VIF of 2.31, values are well below the recommended cutoff value of 10.00 (MacKenzie et al., 2011), indicating no issues of multicollinearity. Further details are in Table 2-4.

Table 2-3: Descriptive statistics and correlation table

	Mean	S.D.	Min	Max	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Age	50.23	11.96	22.00	80.00											
2. Gender (1)	0.87	0.33	0.00	1.00	0.14										
3. R&D investments	1.70	0.60	0.00	3.43	-0.07	-0.11									
4. Turnover	3.28	1.05	1.53	7.01	-0.15+	-0.00	-0.11								
5. Number of employees	5.14	0.86	3.91	8.54	-0.12	0.02	-0.12	0.91***							
6. Firm age	3.91	0.78	0.69	5.75	-0.03	0.05	-0.24**	0.22**	0.21*						
7. Generational stage	2.61	1.44	0.00	9.00	-0.08	0.00	-0.17+	0.28***	0.26***	0.74***					
8. Equity ratio	0.50	0.21	0.10	1.00	-0.24**	-0.01	0.05	0.19*	0.15+	0.12	0.16+				
9. Legal form	3.48	0.59	2.00	4.00	0.01	-0.02	0.05	-0.08	-0.08	0.40***	0.38***	0.11			
10. Liquidity of shares	1.04	0.73	-0.48	3.19	0.10	0.08	0.15+	-0.02	-0.04	0.15+	0.13	0.10	0.04		
11. Open communication	5.20	1.50	1.00	7.00	-0.00	-0.07	0.28***	-0.04	-0.02	0.14	0.11	-0.05	0.05	0.38***	
12. Innovation	4.50	1.44	1.00	7.00	-0.09	-0.04	0.28***	0.03	0.07	0.08	0.13	-0.02	-0.06	0.28***	0.56***

N=126; + p < .1 * p < .05; ** p < .01; *** p < .001; (1) CEO gender: 0 = male, 1= female

Table 2-4: Variance Inflation Factor (VIF)

Variable name	VIF	1/VIF
<i>Controls (individual level)</i>		
CEO age	1.12	.890
CEO gender	1.05	.952
<i>Controls (firm level)</i>		
R&D investments	1.25	.801
Turnover	6.05	.165
Number of employees	5.94	.168
Firm age	2.52	.397
Generational stage	2.41	.416
Equity ratio	1.19	.846
Legal form	1.30	.767
<i>Independent variable</i>		
Liquidity of shares	1.26	.795
<i>Mediator variable</i>		
Open communication	1.34	.744
Mean VIF	2.31	

Regression Results

Table 2-5 describes the results of my robust OLS regression on innovation. The dependent variable is innovation, measured with the four-item scale of Mihalache et al. (2012). Appendix B shows the validation check of my independent variable by using an inquired general item of liquidity instead of the index of family business liquidity. In the appendix, the two-item scale from Hsu and Chang (2011), measuring radical innovation, is the dependent variable. Finally, *turnover generated by new products* is used as the dependent variable in the appendix.

In the first model, I control for the age and gender of the respondents, firm age and generational stage (measured as the present generation managing the firm), firm size (measured as turnover and numbers of employees), legal form, R&D investments, and

equity ratio. As can be seen in Table 2-5, only R&D investments show significant correlations ($\beta = .80, p < .001$), and the explained variance (R^2) of the control model accounts for 13.7%.

In order to test the direct effect of liquidity on innovation (hypothesis 1), I include liquidity, measured with the index of family firm liquidity, in the second model. Liquidity is positively and significantly associated with innovation ($\beta = .49, p < .01$) (see Table 2-5). The overall explained variance increases by .055 compared to the control model, supporting the explanation power of the predictor variable. To validate the improved explanation power of Model 2, I conduct a likelihood ratio test between Models 1 and 2. The significant results ($\chi^2 = 8.34, p < .01$) confirm the improved model fit of Model 2. The positive and significant pair-wise correlation between liquidity and innovation (see Table 2-3), the positive and significant relationship in regression Model 2 between liquidity and innovation, and the significantly improved model fit compared to the control model support hypothesis 1. The data confirms that higher liquidity of shares of family firms leads to increased innovation outcomes in these companies.

Next, I test the relationship between the hypothesized mediator variable open communication and the dependent variable innovation. The pair-wise correlation between the variables shows a positive and highly significant relationship ($\beta = .56, p < .001$). The regression results support this suggestion. Regressing innovation on communication and the control variables again shows a positive and highly significant relationship ($\beta = .50, p < .001$) between the mediator and the dependent variable. The increased explanation power of this model up to an R-squared of .228 compared to the control model together with the significant results of the likelihood ratio test results ($\chi^2 = 38.56, p < .001$) further confirm the hypothesized relationship. Overall the data support hypothesis 2, confirming

that open communication among family members has a positive effect on innovation outcomes in family firms.

Finally, I conduct an analysis to test for the mediation effect of communication with a test of the relationship between liquidity and the hypothesized mediator variable open communication and a regression of the full model, including the control variables, the independent variable and the mediator variable. A pair-wise correlation between liquidity and open communication shows positive and highly significant values (see Table 2-3). Additionally, a regression of communication on liquidity and the control variables shows a positive and highly significant relationship between the independent variable and the mediator variable ($\beta = .66, p < .001$), thereby confirming the positive relationship between the liquidity and the mediator variable communication. In the full regression model, open communication shows a positive and highly significant relationship with innovation ($\beta = .47, p < .001$), whereas the direct effect of liquidity on innovation decreases and becomes insignificant ($\beta = .18, p > .1$), therefore supporting a full mediation of communication. The increase of the explained variance by .179 compared to Model 2 further underlines the importance of the mediation variable communication. Significant results of the likelihood ratio test ($\chi^2 = 31.53, p < .001$) confirm the improved model fit compared to the direct effect model of liquidity. A Sobel-Goodman Test verifies the regression results and indicates a ratio of 71.9% of the total effect that is mediated. The direct effect of liquidity on innovation is again positive yet insignificant, while the indirect effect via communication is positive and highly significant ($\beta = .40, p < .001$). To control for the standard error for the indirect effect, bootstrapping (see e.g., Preacher & Hayes, 2008; Shrout & Bolger, 2002) with 1000 replications as recommended by the literature was used and confirmed the stated results. The findings therefore support hypothesis 3, the mediation effect between the liquidity of shares of a family firm and its

innovation outcomes. As the direct effect of liquidity on innovation is insignificant, the variable communication acts as full mediation between liquidity and innovation.

Table 2-5: Results of regression analysis for innovation

	Base model	Independent variable model	Mediator model	Full mediation model
	Model 1	Model 2	Model 3	Model 4
<i>Controls (individual level)</i>				
CEO age	-0.01	-0.01	-0.01	-0.01
CEO gender	-0.03	-0.11	0.09	0.05
<i>Controls (firm level)</i>				
R&D investments	0.80***	0.67**	0.36+	0.34+
Turnover	-0.30	-0.31	-0.19	-0.20
Number of employees	0.44	0.48	0.33	0.35
Firm age	0.11	0.02	-0.15	-0.17
Generational stage	0.15	0.13	0.11	0.11
Equity ratio	-0.59	-0.72	0.14	-0.22
Legal form	0.04	-0.04	-0.19	-0.20
<i>Independent variable</i>				
Liquidity of shares		0.49**		0.18
<i>Mediator variable</i>				
Open communication			0.50***	0.47***
R-squared	0.14	0.19	0.37	0.37
Comparison to	-	Model 1	Model 1	Model 2
Δ R-squared	-	0.06	0.23	0.18
Likelihood-ratio χ^2	-	8.34**	38.56***	31.53***
Adjusted R-squared	0.07	0.12	0.31	0.31

N=126; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

DISCUSSION AND CONCLUSION

Innovation is essential for firms to survive in the long term (Baumol, 2004; Cefis & Marsili, 2005, 2006; Salvato, 2004). Moreover, innovation is specifically important for family firms, considering their intent to pass on the company to coming generations (Zellweger et al., 2012). To better understand the antecedents of this critical success factor, I develop and test hypotheses on how the liquidity of shares of a company and open communication among family members represent and influence resources that affect a company's innovation outcomes. Collected data from 126 German family firms of the mechanical engineering industry confirm my hypothesis that liquidity of shares increases innovation in family firms. While my analysis shows that liquidity is an important antecedent of innovation, further analyses demonstrate that liquidity has only an indirect effect via communication on innovation. I can therefore also confirm my further hypotheses, resulting in a full mediation effect of communication between liquidity and innovation. In other words, the direct effect of liquidity of shares on the innovativeness of family firms turns out to be insignificant when controlling for communication. However, liquidity leads to higher levels of open communication between family members, which in turn lead to higher innovation.

My study contributes in several ways to the literature of family businesses and innovation. First, it highlights again the importance of communication among family members. Not only does communication keep the family united, it also gives the company significant advantages in the form of increased innovation. My findings also suggest that the efficiency of R&D investments within family firms is highly dependent on open communication between family members which sheds light on the under-researched role of the family in the relationship between innovation inputs and innovation outputs (De

Massis et al., 2013). Therefore, further research should focus on the relationship between R&D investments of family firms and communication within the owning family.

Second, communication cannot only be stimulated by family meetings or early involvement of family members in the firm (Ward, 2004), but also by giving family members the potential chance to sell their shares. This provides a stimulus for both the managing family members and the “passive” shareholders to increase integration of engagement and communication. This should also bring practitioners, who try to keep the family firm under control by limiting liquidity, to rethink their assumptions as they might face the dilemma between keeping the shares within the family by restricting sales and increasing communication and participation of family shareholders via increased liquidity. Indeed, it is not passive, uninvolved shareholders, but proactive family members who improve the prospect and likelihood of innovation and hence long-term success. Additionally, my work highlights the role of share liquidity as a latent factor, indirectly influencing strategic behavior of a firm, such as innovation.

Third, my analysis contributes to the understanding of the role of the family in the process of technological innovation as called for by De Massis et al. (2013). This paper shows that the innovation of new products in the German manufacturing industry depends heavily on the “soft factor” of communication between family members. Additionally, the psychological effect of liquidity in stimulating participation and interest and therefore communication among all family members shows the importance of latent factors that influence the family and eventually the firm.

Fourth, I contribute with this article to the ongoing debate about family influence on innovation in family firms (De Massis et al., 2013; Sciascia et al., 2013) and the heterogeneity debate in family business research (Chua et al., 2012; Sharma et al., 2012).

By comparing family firms within one industry, my study shows the importance of differentiation among family firms. Studies that compare the innovativeness of family firms and non-family firms find contradicting results (Sciascia et al., 2013). This paper suggests that family influence has different effects on the innovativeness of firms, depending on the communication among family members. Furthermore, underlying latent factors, such as high liquidity of shares, have the potential to increase innovation in family firms, making it important to further understand the still under-researched differences that exist among family firms. This is especially interesting considering the study of Duran et al. (2015), who find that family firms show lower innovation input but higher innovation output than non-family firms. As they point out, only the efficient use of R&D resources can lead to high innovation output. Understanding the role of liquidity and communication in this regard presents another step towards understanding the differences in innovation between family and non-family firms and among family firms.

Fifth and last, this study contributes to family business research by increasing our knowledge about the RBV in family firms overall and about familiness in particular. Pearson, Carr, and Shaw (2008: 966) conclude their study about familiness with the call to further identify “resources and capabilities unique to family firms”, especially when they are “associated with the interaction and involvement of family”. By identifying the financial construct liquidity as an antecedent of open communication and open communication as a driver of innovation outcomes I present two factors that can represent resources unique to family firms when managed correctly. This shows that family ownership can lead to a competitive advantage when the firm manages to benefit from the pool of “passive” family members. Future studies have to analyze the influence and value of these resources in the context of a comparison between family and non-family firms.

Limitations and Future Research Directions

My research bears some limitations that should be considered when interpreting my results. At the same time, they open opportunities for future studies in this field of research. First and foremost, my research concentrates on small to medium sized German family firms in the mechanical engineering industry. While this allows me to compare innovation and other results more accurately and therefore improves the quality of my conclusions it limits the possibilities of generalizing my results. Future research should test my hypotheses in different environments such as different countries, different industries, or other firm sizes. These characteristics could influence the effect of liquidity and communication on innovation, which in turn would increase the understanding of family firm heterogeneity as called for by Sharma et al. (2012) among many other researchers. One especially interesting question with respect to different environments is how the tested effects change in developing countries with higher uncertainty regarding future developments.

Furthermore, this study design is cross-sectional, thus limiting the possibility of clearly determining the effective direction of my tested constructs. While I address this issue of endogeneity by providing theoretical explanations of the effective direction and by using indices that limit the danger of endogeneity, longitudinal studies should be conducted in future research to further clarify these issues.

Finally, only one respondent per firm was asked to answer my questionnaire. Although I expect the answers to be representative for other shareholders too, consulting multiple shareholders or family members per family firm would improve the quality of the subjective factors, as proposed by, e.g., Eddleston and Kellermanns (2007) and

Zellweger et al. (2012). Future research might therefore control for changes of individual perception.

Conclusion

Innovation of family firms is influenced by the owning family and the way they are involved in the firm. Market liquidity of shares increases the interest that family shareholders show in the family business and improves open communication within the family. This in turn significantly improves the innovation outcomes of family firms.

Link between Essays 1 and 2 and Essay 3

Essays 1 and 2 of my dissertation borrow from the financial literature and incorporate the construct of liquidity into family business research. The first essay provides the basis for the analysis of family firms' liquidity by introducing the index of family firm liquidity. The second essay applies this index and shows the importance of liquidity as a factor of influence for open communication and innovation outcomes. The goal of the third essay is to contribute to mainstream finance research. Building upon the insights of family business research, especially non-economic utility and generational differences among family firms, the next chapter examines disclosure policies and liquidity of publicly listed family and non-family firms. This increases our understanding of family firms in the context of regulated markets and highlights the importance of not considering shareholders as one uniform group, but differentiating between underlying preferences and characteristics.

ESSAY 3: Market Liquidity and Disclosure Policies of Family Firms: The Influence of Generational Differences¹⁰

INTRODUCTION

While the family business literature has received growing interest over the past decades, the focus was for a long time on non-financial topics such as succession or governance (Chrisman et al., 2005). Recently, the literature has broadened its scope, incorporating topics from related research fields, such as finance. However, a large part of the studies on financial aspects still focus on the differences in performance between family firms and non-family firms (Anderson & Reeb, 2003a; Fahlenbrach, 2009; Villalonga & Amit, 2006). The growing importance of understanding family firms' financial structure can be seen in the increasing number of publications providing a different view of various financial aspects of family firms. Besides market performance, researchers have analyzed tax planning (Chen, Chen, Cheng, & Shevlin, 2010), financing costs and investment decisions (Anderson et al., 2003; Andres, 2011; Chen et al., 2014), corporate governance (Villalonga & Amit, 2006), and financial reporting (Ali et al., 2007; Anderson et al., 2009; Chen et al., 2008; Wang, 2006) of listed family firms. In the context of financial structure, market liquidity, i.e. "the ease of trading a security" (Amihud et al., 2005: 270), is an important characteristic of a firm. Higher liquidity results in lower required net returns and therefore higher share prices (Amihud & Mendelson, 1986b), increases investments and economic growth (Henry, 2000; Levine & Zervos, 1998), and influences a variety of further aspects such as corporate governance, executive compensation, and corporate policies (see Foucault et al., 2013).

¹⁰ This essay is an unpublished manuscript written with co-author Jun.-Prof. Dr. Max Leitterstorf.

One important determinant of liquidity is the information asymmetry between investors, i.e., that one party has better information than the other (Akerlof, 1970). The literature has shown that market equilibrium is only possible under the condition of asymmetric information, as otherwise no incentives would exist for any investor to gather information in the first place (Grossman & Stiglitz, 1980). The equilibrium is finally reached as a function of supply and demand between uninformed and informed traders with the market makers as the providers of quoted bid-and-ask prices (Kyle, 1985). Companies have a variety of incentives to influence the level of information that is available to outsiders, since it is not only a factor of influence on liquidity, but also of the cost of capital of a company and its competitive position in the market (Healy & Palepu, 2001).

A wide range of the existing literature argues that shareholders taken as a single group “prefer more voluntary disclosure of timely information” (Chen et al., 2008: 505), which includes “management forecasts, analysts’ presentations and conference calls, press releases, internet sites, and other corporate reports” (Healy & Palepu, 2001: 406). However, recent studies have challenged the simplified perspective of shareholders as a uniform group. Among other criteria that distinguish different shareholder groups, family influence on a company has been pointed out in some studies to affect voluntary disclosure decisions (Ali et al., 2007; Chen et al., 2008; Chen et al., 2014; Gomez-Mejia et al., 2014; Stockmans, Lybaert, & Voordeckers, 2010). When families are the dominant shareholders of companies, they have both the direct and indirect means to control important decisions (Cennamo, Berrone, Cruz, & Gomez-Mejia, 2012; Gomez-Mejia et al., 2014; Gomez-Mejia et al., 2011) such as the disclosure of information. While various studies assess differences in voluntary disclosure between family firms and non-family firms, the results are still inconclusive (Chen et al., 2014; Gomez-Mejia et al., 2014). One

reason for this might be the lack of differentiation among family firms. Acknowledging the heterogeneity of family firms and differentiating between aspects such as generational stage can improve the understanding of family firms' decisions about financial structure and move research on this topic from the "*either/or* question on whether family firms are more or less likely to [...] voluntarily disclose information" (Gomez-Mejia et al., 2014: 398).

The research goal of this study is therefore to analyze in a broader context to what extent family firms differ in their disclosure decisions and the liquidity of their shares compared to non-family firms. In a narrower scope, we analyze generational effects between first-generation family firms and later-generation family firms on disclosure decisions and eventually on the liquidity of their shares.

This study mainly provides further insights into the differences of disclosure and liquidity between family and non-family firms by accounting for generational differences among family firms. We analyze the basic preferences of differing family firms with respect to disclosure and liquidity and provide further explanations for differences concerning these matters among listed companies. The focus is therefore to shed some light on the reasons for still contradictory results of previous research (Chen et al., 2014) by taking into account the motives behind disclosure decisions and liquidity policies. In order to understand theoretically the differences between family firms and non-family firms as well as differences among family firms, a focus on agency problems as in earlier papers (Ali et al., 2007; Chen et al., 2008; Chen et al., 2014) is not enough. We additionally apply the theoretical framework of SEW of Gómez-Mejia et al. (2007) that develops theoretical explanations for our analysis. This contributes to the recent call of Gomez-Mejia et al. (2014) to analyze size and time effects with respect to SEW

preferences of family firms. With respect to differences of share liquidity, we follow Stoll (2000) in his differentiation between *real friction* and *informational friction*. To test the hypotheses we develop from this theoretical framework, we analyze 225 German family and non-family firms listed on the Frankfurt stock exchange.

The rest of this study is structured as follows: First, we develop our hypotheses based on a theoretical background building on the literature of family firms, voluntary disclosure, and liquidity. Second, we provide information about the methodology of our study, including sample information and information about the data collection, measures and type of analysis. Third, we present the results of our analysis. The discussion and conclusion conclude this study.

THEORETICAL BACKGROUND AND HYPOTHESES DEVELOPMENT

Building on family business research and the literature on liquidity and disclosure policies, we develop the resulting hypotheses in this section of our article. We use agency theory as the theoretical framework for this study; the construct of SEW is applied to investigate further characteristics of family firms that are not covered by agency theory. In this section, we first give a brief introduction to the literature on market liquidity. Second, the effect of family firm status on liquidity is analyzed. Third, the influence of family firm status and generational differences on voluntary disclosure are explored. And fourth, the mediating role of voluntary disclosure between family firm status and liquidity is examined.

Market Liquidity

Building on asset pricing theory and frictions in imperfect markets, scholars examine the costs of trading an asset, which leads to the literature on liquidity. Briefly

described by Amihud et al. (2005: 270) as "the ease of trading a security", market liquidity represents a highly complex latent variable. Foucault et al. (2013: 8) define liquidity as "the ability to trade a security quickly at a price close to its consensus value". This is similar to Liu (2006: 631), who defines the concept as "the ability to trade large quantities quickly at low cost with little price impact". Following these definitions as we do in this paper, market liquidity of shares first of all has an effect on the costs of an investment. Illiquid assets cost more to buy and eventually sell for less, therefore reducing the return on this investment (Foucault et al., 2013). To balance the market, illiquid securities offer a higher expected return and therefore lower the price of a security (Amihud & Mendelson, 1986a, 1986b). However, liquidity has an influence on matters that reach further than the decisions of investors in the market. Liquidity can lower the cost of capital of a firm and therefore increase its overall value (Amihud & Mendelson, 1986a). Additionally, liquidity affects firms in a multitude of ways, as it has an influence on corporate governance and executive compensation (Foucault et al., 2013) and can increase investments and economic growth (Henry, 2000; Levine & Zervos, 1998).

Real Friction of Family Firm Blockholdings

Family firms are defined by their special characteristics, an important one of which is keeping the company under the control of the family (Zellweger et al., 2012). Following the official definition of the European Commission (2009), at least 25% of the voting rights of a company have to be held by the founder or his/her family to be classified as a family firm. This leads to a significant difference in the ownership structure of family firms compared to otherwise similar non-family firms. Having a large blockholder by definition decreases the liquidity of family firm shares, as fewer shares are available for trading (Brockman et al., 2009). This effect is part of what is referred to as *real friction* by Stoll (2000) and uses up *real resources* of the trading process. Brockman et al.'s

empirical results “show that block ownership takes potential trading activity off the table relative to a diffuse ownership structure and impairs the firm’s market liquidity” (2009: 1403). Furthermore, family ownership in the form of large blockholdings might reduce the number of individual shareholders. This in turn has been argued to increase illiquidity by Amihud, Pedersen, and Uno (1999), who have shown that an increase of the base of individual investors increases the liquidity of shares and thereby the stock price of a firm.

Apart from frictions that are influenced by blockholders reducing the number of free-floating shares of a company, holding periods of shares play an important role. Brockman et al. (2009) state that “[i]n particular, if blockholders trade significantly less than non-blockholders, the reduction in trading activity will increase real friction costs by spreading fixed real costs over fewer trades” (Brockman et al., 2009: 1404). For institutional non-family blockholders like banks, investment funds, or widely held corporations, private benefits that can be gained from control over a company are diluted among multiple individual owners (Villalonga & Amit, 2006). Family owners, however, do not only profit monetarily from their share ownership, but also have non-economic goals such as keeping their reputation or maintaining the legacy of the family that Gomez-Mejia et al. (2007; 2010) sum up as the SEW of owning families. One important characteristic of owning families is the goal to preserve their SEW (Gomez-Mejia et al., 2007), which does not only count for privately held firms, but is also pursued by family firms when listing their companies on stock exchanges (Leitterstorf & Rau, 2014). In order to be able to preserve their SEW, owning families have to keep the control over the business, and, even more important, aim to pass this control on to the next generation (Chua et al., 1999, 2003; Gomez-Mejia et al., 2011; Zellweger et al., 2012). Compared to non-family blockholders, this might change the trading behavior of family blockholders significantly, prolonging the holding periods of shares when possible until they can be

handed over to next generations (Chen et al., 2008) which reduces the amount of traded shares significantly.

Informational Friction of Family Blockholdings

Apart from the direct effect or *real friction* of family blockholdership on the trading process and therefore on liquidity, a second factor, referred to as *informational friction* by Stoll (2000), has been analyzed in the literature. *Informational friction* occurs when one group of investors has inside knowledge that other investors do not possess (Stoll, 2000). With regard to family firms, *informational friction* can have two causes. First, the inside group, i.e., the family, can possess superior knowledge about fair share prices compared to outside investors and market makers. Second, the family might have inside information regarding the management of the firm that outsiders are not able to evaluate, i.e., agency problems. Both aspects are further explained in the following paragraphs.

The owning family as the blockholder can have access to more private valuable information about the company, or can even develop this information due to their position within the firm (Heflin & Shaw, 2000). As a result, there is a big gap of information between blockholders (the family) and minority shareholders. Asymmetric information in turn leads to *informational friction* and therefore illiquidity, as any market maker faces the risk of selling to or buying from a trader with superior information (Stoll, 2000). Consequently, market makers have to increase the spread between their bids and asks in order to offset potential losses to informed traders (Stoll, 2000). As minority shareholders normally do not want to play an active role in the firm they acquire shares of, they face the risk of expropriation under asymmetric information (Healy & Palepu, 2001). This limits their incentive to acquire shares of family firms without proper compensation.

Heflin and Shaw (2000) confirm that blockholdings increase illiquidity as a result of asymmetric information between majority and minority shareholders.

Agency costs as referred to by Jensen and Meckling (1976) and later described as agency problems type 1 arise between two parties (the agent and the principal) of a contract due to their conflicting interests and asymmetric information. Agency problems would be solved if both parties had the same interests (Jensen & Meckling, 1976) or if the principal possessed the same information as the agent (Ross, 1973). Blockholdings have been found to increase the monitoring of the management through the shareholders (Morck, Shleifer, & Vishny, 1988) and thereby reduce agency costs arising from the conflict between owners and managers (e.g., Barclay & Holderness, 1991; McConnell & Servaes, 1990). While most scholars agree that the separation between ownership and management produces costs that can be mitigated by an active dominant shareholder (e.g., the owning family (Chrisman et al., 2004) as proposed by Jensen and Meckling (1976) and Fama and Jensen (1983)), research has found other agency problems to produce costs in firms with dominant shareholders. Morck et al. (1988) argue that while majority shareholders can improve the monitoring of the management, entrenchment of these shareholders can bring about costs for minority shareholders. Compared to non-family firms with fewer dominant shareholders, the owning families of family firms have more possibilities and incentives to act in their own interests rather than in the interest of minority shareholders. In their comparison of agency problems between family firms and non-family firms, Chrisman et al. (2004) find that family firms also face agency problems, albeit different ones from average non-family firms. These include free-riding of family members (Bruce & Waldman, 1990), internal dysfunction and expropriation of minority shareholders (La Porta et al., 1999), managerial entrenchment (Morck et al., 1988), and negative effects of family altruism leading, e.g., to incompetency of family heirs (Schulze

et al., 2003b; Schulze et al., 2001). These problems add up to the majority-minority shareholder agency costs or agency problems type 2. Research has shown that these costs are especially high in countries with low shareholder protection or where family ownership is very high (Maury, 2006) and are more costly in second generation plus family firms than in founder-led family firms (Villalonga & Amit, 2006). The owning family therefore has the ability and incentive to influence the decisions of the company in favor of the family rather than in favor of the minority shareholders. However, other shareholders and market makers do not know whether or to what extent the family engages in such actions, as this information is costly or not at all possible to get, resulting again in asymmetric information that can lead to lower liquidity.

In sum, family ownership has a direct effect on the trading process of a company's shares in the form of *real friction*. Due to fewer shareholders and longer holding periods, this effect is expected to lower family firms' liquidity. Additionally, agency problems and inside knowledge of the owning family can lead to *informational friction* which is also expected to impede liquidity. Taking these effects into account, we expect that:

Hypothesis 1: Family firms' shares have lower market liquidity than non-family firms' shares.

Family Firms and Voluntary Disclosure

A wide range of the existing literature argues that shareholders, taken as a single group, "prefer more voluntary disclosure of timely information" (Chen et al., 2008: 505), which includes "management forecasts, analysts' presentations and conference calls, press releases, internet sites, and other corporate reports" (Healy & Palepu, 2001: 406). However, recent studies have challenged the simplified view of shareholders as one uniform group. Among other criteria that differentiate between shareholders, family

influence on a company has been pointed out in various studies to affect voluntary disclosure decisions (Ali et al., 2007; Chen et al., 2008; Chen et al., 2014; Stockmans et al., 2010).

The literature on firm disclosure argues that disclosure overall and especially voluntary disclosure are important means of increasing firm value for shareholders by increasing stock liquidity, reducing the cost of capital, and increasing information intermediation (Healy & Palepu, 2001). Following this theory, voluntary disclosure reduces agency problems between managers and outside investors (agency problem type 1) by reducing the information problem that the outside parties face (Healy & Palepu, 2001). This problem of the management's not acting in the interest of shareholders is mitigated in family firms. Due to the strong position of family shareholders in the firm and their focused interest and knowledge of the company, families are willing and able to better monitor the management (Ali et al., 2007; Anderson & Reeb, 2003a; Morck et al., 1988) or even combine ownership and management positions (Anderson & Reeb, 2003a). Furthermore, families have by definition a substantially higher stake in their companies than other investors with a diversified portfolio. Following this line of argument, family firms would want to provide more voluntary disclosure as their main shareholder, the family, benefits significantly from reducing the mitigated but still existent agency problems with outside parties such as lenders (Chen et al., 2008). Indeed, Wang (2006) and Ali et al. (2007), among others, find for samples of S&P 500 family and non-family firms a better quality of reported earnings for family firms. However, this takes only agency problems between managers and outside investors into account. It has yet not been clearly identified what part the family as the dominant owner plays in the decision process of disclosure. Some studies have tried to capture the diverging characteristics of the family (e.g., Wang, 2006), however "notably lacking in the literature

is the role of [the] controlling owners' diverse interests in enacting firm discretion in financial reporting" (Gomez-Mejia et al., 2014: 388).

To get a better understanding of the disclosure decisions of family firms, we differentiate in the following between corporate governance disclosure and accounting information disclosure. While corporate governance disclosure can be seen as a monitoring device for investors that have allocated their capital and therefore affects current stakeholders, disclosure of accounting information provides a basis for investors when deciding on their capital allocation (Beyer, Cohen, Lys, & Walther, 2010). In addition, we investigate the possibility of diverging interest between family firms by differentiating between first generation family firms and later generation family firms.

Corporate Governance Disclosure

While the concentrated ownership of families increases the alignment between owners and managers and therefore reduces type 1 agency problems, agency problems between minority and majority shareholders, i.e., type 2 agency problems, are thereby increased (Wang, 2006). According to Morck et al. (1988) and Chrisman et al. (2004) among others, the controlling shareholders (i.e., the families) have the power and incentive to gain private benefits from minority shareholders. This can lead to actions such as tunneling (Johnson, La Porta, López-de-Silanes, & Shleifer, 2000), free-riding of family members (Bruce & Waldman, 1990), dividend management (DeAngelo & DeAngelo, 2000), managerial entrenchment (La Porta, López - De - Silanes, Shleifer, & Vishny, 2002; Morck et al., 1988), or negative effects of family altruism leading, e.g., to incompetency of family heirs (Schulze et al., 2003b; Schulze et al., 2001), all at the expense of minority shareholders. To engage in such actions, families have the incentive to disclose less, especially concerning their corporate governance practices (Ali et al.,

2007). Wang (2006) shows the contradictory agency problems within family firms: On the one hand, family control increases alignment between owners and managers, due to the high stake of the family in the firm and their long-term orientation. This leads to better control of the firm, lower likelihood of expropriation of minority shareholders, and more transparency of the firm to improve contracts with outsiders, such as lenders or new investors. On the other hand, concentrated ownership gives rise to entrenchment, as the family has the possibility and incentive to increase their own benefits at the expense of minority shareholders. Interestingly, both effects can lead to improved disclosure by family firms (Wang, 2006). While entrenchment incentivizes family firms to disclose less in order to be able to extract benefits for the family only, it creates at the same time market demand for increased transparency, when outsiders expect this behavior. Similarly, alignment of the family and management fosters disclosure to other stakeholders and at the same time decreases market demand for detailed information.

Apart from agency problems, family firms consider the SEW of the family when making decisions. According to this concept, the management of family firms does not only take monetary considerations into account, but also tries to maximize the non-economic utility of the controlling family in the form of protection of the reputation and privacy of the family or maintaining family control and family harmony (Gomez-Mejia et al., 2007). Previous studies have found that family firms are even willing to sacrifice their economic benefits in order to preserve their SEW (e.g., Leitterstorf & Rau, 2014). Therefore, even if more voluntary disclosure were to bring family firms monetary benefits in the form of lower cost of equity capital (Botosan, 1997) and debt (Chen et al., 2014), family firms might prefer to limit their voluntary disclosure of corporate governance to protect factors such as the privacy of family members that are part of their SEW.

Looking at highly regulated markets with strong shareholder protection like the German market, the costs of less corporate governance disclosure might be lower than the benefits of higher secrecy that family firms face. Following both frameworks – agency theory in its prediction that majority shareholders can benefit at the expense of minority shareholders and the concept of SEW that assumes family firms want to protect the privacy and status of the owning family – we propose:

Hypothesis 2a: Family firms disclose less information about their corporate governance than non-family firms.

These factors are also influenced by differences among family firms. Indeed, family firm research has often stressed the importance of taking family firms as a heterogeneous group instead of assuming them all to show similar characteristics (Chrisman & Patel, 2012; Chua et al., 2012; Sharma, 2004; Sharma et al., 2012). The inconclusive results of family firms' disclosure decisions have also been argued to stem from the undifferentiated view of family firms as one uniform group (Gomez-Mejia et al., 2014).

In the context of heterogeneity, one important and heavily considered difference among family firms is their generational stage (Gersick, Davis, McCollom Hampton, & Lansberg, 1997). In their introduction of the F-PEC scale to measure family influence, Astrachan, Klein, and Smyrnios (2002; 2005) present three criteria that define a family firm: power, experience, and culture. Generational stage of ownership and management represents the dominant aspect of the subscale experience, where later generations account for more experience and therefore greater family influence. Further studies show that later generations put a different emphasis on family matters within the firm than does the founder generation, altering therefore the effect that SEW might have on the disclosure of corporate governance information. Sonfield and Lussier (2004) demonstrate

that later generation family firms have a stronger focus on succession plans than founder-generation firms. Zellweger et al. (2012) in turn show that transgenerational intent increases the SEW that family members attribute to their firm, indicating a higher SEW of later generations. Furthermore, several studies have shown differences between first and later generations regarding their governance practices, management, and performance (e.g., Dyer, 1988; Ling & Kellermanns, 2010).

Building on this, we argue that different generations have differing views on the purpose of their business. Le Breton-Miller and Miller (2009) propose that family members in firms with growing numbers of involved family members and factions in stages of later generations have more possibilities and incentives for the pursuit of family goals only, as they are less connected with other stakeholders and therefore act less like stewards of the company. Similarly, a privileged childhood (Schulze et al., 2003b) and a dilution of responsibility and pride (Gersick et al., 1997) can lead to more egoistic behavior compared to the active social engagement of the first generation. Later generation family firms are furthermore characterized by a growing number of passive shareholders and family branches (Jaffe & Lane, 2004) that are less connected to the firm and prefer short-term profits (Schulze et al., 2003b; Vilaseca, 2002). This reduces the alignment of family and management and therefore the incentive to uphold the transparency of the firm (Wang, 2006).

Finally, financial needs are an important factor of consideration for corporate disclosure (Healy & Palepu, 2001) that can potentially be influenced by the family's preferences (Gomez-Mejia et al., 2014). With respect to the generational stage of a family firm, corporate governance disclosure depends on the financing choices of first generation and later-generation family firms. As Sonfield and Lussier (2004) point out, first-

generation family firms grow through the sale of shares and depend generally more on equity than do later generation family firms. This can pressure first generation family firms to disclose more corporate governance information in the attempt to close the information gap, mitigate agency problems, and therefore attract outside investors.

To sum up, we expect later generation family firms to differ significantly from first generation family firms. First, we expect these companies to place a higher value on their SEW, in the form of family privacy. Second, we expect later generations to be less connected to the firm and have lower alignment with the management, and therefore fewer incentives to provide transparency. Third, we expect the differing financing decisions of generations to influence the disclosure of corporate governance so that that later generations face less pressure to provide this information to outside investors. This leads to the conclusion that:

Hypothesis 2b: First generation family firms provide more information about their corporate governance than later generation family firms.

Accounting Information Disclosure

Apart from corporate governance disclosure, firms have to decide on the amount and quality of accounting information they provide. Although regulations in developed countries like the US and Germany are very strict, managers still have access to superior information compared to outside investors (Beyer et al., 2010; Healy & Palepu, 2001) and decisions can be made with regard to voluntary information and the timing of disclosure. Again, companies have to decide between the costs of disclosure and the incentives for it. While higher levels of accounting disclosure are generally favorable for a company in various ways, including lower costs of capital and signaling of management talent (see e.g., Healy & Palepu, 2001), there are also associated costs that vary with the

intention and type of investment of the shareholders. First, providing voluntary disclosure implies direct costs in the form of preparation for press conferences, additional listing or auditing fees, and regulation-compliant costs for the existing shareholders (Beyer et al., 2010; Foucault et al., 2013). Second, disclosed information can be seen as a public good, paid for by the existing shareholders. Potential investors can free-ride on this information, reducing the willingness of the shareholders to provide it (Healy & Palepu, 2001). Third, disclosure can reduce the value of a company by providing information to third parties such as tax authorities and competitors (Gomez-Mejia et al., 2014). Specifically, disclosure hands valuable information to competitors or even creates competition by providing insights into profitable branches of the company (Chen et al., 2008; Foucault et al., 2013). Last, voluntary disclosure has been found to be costly as it can increase the risk of litigation (Skinner, 1997).

Compared to non-family shareholders, the investment horizon of family firms is longer, characterized by a transgenerational intent (Chua et al., 1999, 2003). This reduces the importance of short-term raises in share prices or short-term earnings which can come about because of further voluntary disclosure (Chen et al., 2008). Indeed, Anderson et al. (2003) argue that the goal of entrepreneurial families is to pass on their company to coming generations rather than selling their shares at a high price and consuming their wealth. In our context this leads to family shareholders being less interested in the short-term benefits of disclosure and more concerned about the cost of additional information being made public. Taking into account that non-disclosure also brings about costs for a company (Beyer et al., 2010), this might result in a tradeoff where information is disclosed, however not perfectly detailed or less timely. Following Chen et al. (2008), “founding families [...] face more potential costs than benefits from disclosure of timely information” (2008: 509).

Finally, agency costs between management and shareholders can be reduced by the incentives and possibilities of the family to monitor the management (Morck et al., 1988) or due to the goal alignment between family and management (Wang, 2006). Following this line of argument, “outside shareholders of family firms may rely less on the quality of financial statements to monitor family members (insiders) because outside shareholders’ interests are better aligned with those of the founding families. In other words, the contracting terms for family firms are less sensitive to the quality of financial information than those for nonfamily firms. This, in turn, gives family firms less incentive to report high-quality financial information” (Wang, 2006: 622).

Considering that disclosure of the most important accounting information is widely regulated and combining this with the alignment of family and management and the suggested preferences of family firms for long-term performance rather than short-term benefits, we assume that:

Hypothesis 3a: Family firms are more reluctant to disclose accounting information than non-family firms.

This can be specifically important for the founding generation of family firms. “[I]n thinking about the future, the founding leader of a family firm seeks to grow the business while also attaining longevity in familial leadership” (Eddleston, Kellermanns, Floyd, Crittenden, & Crittenden, 2013: 1191). The founding generation is strongly focused on the long-term success of their firm. Later generations, in contrast, are often less active in growing the company and arguably prefer short-term profits and pay-outs (Bammens, Voordeckers, & Van Gils, 2008). Founders of firms are concerned about their businesses in significantly different ways than their descendants. While their heirs can often look back on a secure and privileged childhood (Schulze et al., 2003b), founders have to worry

considerably more about the company up to a point where they are interwoven with their business beyond rationality (Daily & Dollinger, 1992). This can lead to differing preferences concerning the disclosure of accounting information. Decision makers eventually face a tradeoff: on one side are the costs of voluntary accounting disclosure that is of little value to long-term investors (McNichols & Trueman, 1994) and a threat to the long-term growth of their business (Chen et al., 2008; Chen et al., 2014); on the other side its benefits in the form of, e.g., higher share prices (Healy, Hutton, & Palepu, 1999; Healy & Palepu, 2001) and lower cost of capital (Amihud & Mendelson, 1986a; Chen et al., 2008). Considering their preferences, this again supports the idea that first generation family firms are more reluctant to share accounting information, not only compared to non-family firms, but also compared to later generation family firms which are characterized in general by a growing number of passive shareholders and family branches (Jaffe & Lane, 2004) that are less connected to the firm and prefer short-term profits (Schulze et al., 2003b; Vilaseca, 2002). Furthermore, studies have shown that later-generation family firms are influenced to a greater extent by the external environment and market demands than first-generation firms (Cruz & Nordqvist, 2012), increasing the pressure on these firms to publish timely accounting information, as demanded by the market.

With respect to the influence of family control on disclosure, Wang (2006) differentiates between the alignment effect and the entrenchment effect. Following this line of argument, disclosure of accounting information becomes especially important when the market fears entrenchment of the family and management of a firm. While first generation families are more aligned with the management and are expected to be less reluctant to disclose corporate governance information (see hypothesis 2b), the opposite is true for later generation families, which are less active in the firm and therefore less

aligned with the management (Bammens et al., 2008; Jaffe & Lane, 2004). Additionally, they may be more secretive about their corporate governance practices than first generation family firms and non-family firms (see hypothesis 2b). Following Wang (2006), this creates a strong market demand for financial disclosure by later generation family firms. “[U]sers of financial statements may demand greater earnings quality from family firms if they perceive that family ownership is associated with inferior corporate governance” (Wang, 2006: 625). The incentives for first generation family firms to disclose accounting information, however, are reduced when stakeholders expect corporate governance to favor firm growth and value.

Considering that disclosure of the most important accounting information is widely regulated and combining this with the suggested preferences of founders of family firms for long-term performance rather than short-term benefits, we assume that:

Hypothesis 3b: First generation family firms are more reluctant to disclose accounting information than later generation family firms.

The Mediating Role of Voluntary Disclosure between Family Firm Status and Liquidity

According to the early literature investigating the effect of disclosure on liquidity, disclosure reduces the information asymmetry between insiders of a firm and outside investors, which in turn attracts large investors and therefore increases the liquidity of a company’s shares (Diamond & Verrecchia, 1991; Kim & Verrecchia, 1994). The reasoning is that benefits from private information can be reduced through public disclosure, leading to increased liquidity of the firm’s shares (Foucault et al., 2013). In highly regulated markets, the effect of voluntary disclosure on the liquidity of shares has become an increasingly prominent topic. Various studies indicate that more and

qualitatively better voluntary disclosure leads to higher liquidity (Chen et al., 2008; Healy et al., 1999; Healy & Palepu, 2001). Additionally, more voluntary disclosure has been found to increase current share prices without changes in current earnings (Healy et al., 1999) and based on information about future earnings (Gelb & Zarowin, 2002).

Stoll (2000), in his differentiation between *real frictions* and *informational frictions* as sources of illiquidity of shares, shows that voluntary disclosure should have no influence on *real frictions* of family firms' share liquidity, as the ownership structure and holding periods of family business shares are not changed by disclosure levels. *Informational frictions* as the second source of family firm illiquidity, however, can be mitigated by voluntary disclosure as a means to close the information gap between insiders and outsiders (Healy & Palepu, 2001). This leads to the question of the relevance of increased disclosure of accounting information and increased disclosure of corporate governance practices in highly regulated markets.

In this context, the significance of the effect of increased disclosure of corporate governance practices as a mediator between family firm status and liquidity is questionable. On the one hand, disclosure of corporate governance practices can reduce the size of the information gap between insiders (the family and the management) and outside and minority investors. As argued above, family firms also face agency problems, although different ones than non-family firms (Chrisman et al., 2004). While a dominant shareholder such as the owning family can reduce agency problems between management and owners (Jensen & Meckling, 1976; Morck et al., 1988), agency conflicts arise between majority and minority shareholders due to the superior influence and information of the majority shareholder (Bruce & Waldman, 1990; La Porta et al., 1999; Morck et al., 1988; Schulze et al., 2003b; Schulze et al., 2001). Voluntary disclosure of corporate

governance practices could reduce these problems and lead to reduced uncertainty of outside investors about family specific actions (Wang, 2006), therefore increasing the liquidity of these firms. On the other hand, corporate governance disclosure does not seem to be a great driver of liquidity. Ali et al. (2007) mention that less corporate governance disclosure could result in a lower bid-ask spread. However, they argue that corporate governance disclosure has no effect on financial performance and therefore does not influence analysts' following, which increases liquidity. Furthermore, they find no strong effect of corporate governance disclosure on liquidity, as family firms in their US sample have lower bid-ask spreads even though they disclose less about their corporate governance practices. With respect to reduced majority-minority shareholder agency problems, increased corporate governance disclosure might have an influence. However, Chrisman et al. (2004) show that the family as the majority shareholder has various ways to expropriate the minority shareholders. Therefore, the magnitude of influence of corporate governance disclosure is again questionable, as not all possibilities of minority shareholder expropriation can be addressed by more disclosure.

To sum up, there is some theoretical evidence that increased corporate governance disclosure might reduce informational frictions within family firms, but the magnitude of this effect is expected to be small. Therefore, as we hypothesize that family firms disclose less about their corporate governance practices, we expect:

Hypothesis 4a: Voluntary corporate governance disclosure mediates the relationship between family firm status and liquidity of shares.

Increased disclosure of accounting information, especially of timely information, might have a stronger influence on share liquidity. Indeed, some authors argue that accounting information can reduce uncertainty, and therefore agency costs, between

managers and owners as well as between outside investors and inside investors (Ali et al., 2007; Gomez-Mejia et al., 2014; Wang, 2006). In their study of the effect of auditing on financial decisions, Chang, Dasgupta, and Hilary (2009) show that improved quality of accounting information reduces asymmetric information between insiders and outsiders. Important for all these findings is that managers have more information about the firm's current and future profitability than outside investors. Furthermore, "insiders (both managers and owner-managers) have incentives to exaggerate their firms' projected profitability" (Beyer et al., 2010: 296). This "lemon problem" impedes the asset allocation of outside investors due to asymmetric information and can potentially lead to market failure (Akerlof, 1970). To be solved, this problem demands, according to Beyer et al. (2010), providing and disclosing accounting information in particular. While accounting information disclosure cannot reduce all frictions of family firms, especially not *real frictions* that arise through the ownership structure of this type of firm, part of the *informational friction* described by Stoll (2000) should be mitigated by increased voluntary disclosure of accounting information.

Following the literature on accounting information disclosure and liquidity and expecting family firms to disclose less accounting information, we therefore assume that:

Hypothesis 4b: Voluntary accounting information disclosure mediates the relationship between family firm status and liquidity of shares.

METHODOLOGY

In this section we present the methodology of this paper, including the sample, the collection of data, the variables used to test our hypotheses and control their robustness, and finally the analytical method used.

Sample

For our analysis, we use a sample of family and non-family listed on the Frankfurt Stock Exchange in Germany. To ensure overall high standards of information disclosure in order to have comparable companies, the chosen firms are part of the “prime-standard” which represents the largest and most transparent market segment of the Frankfurt Stock Exchange. In 2015, shares of 323 companies were traded on the stock exchange under the label prime standard, representing 308 singular companies after controlling for companies with multiple share types. To enhance the robustness of our analysis, we excluded financial institutions, including banks, insurance companies and real estate companies, from our sample, as these types of firms face different regulations and show diverging financial characteristics. This led to a sample of 268 non-financial companies of which 34 were excluded as their headquarters were not in Germany. Due to missing data and insolvencies, we had to exclude another nine firms; therefore, a final sample of 225 prime standard firms listed on the Frankfurt Stock Exchange was included in our analysis. The characteristics of this sample can be seen in Table 3-1. Please note that while some firms appear to be very small, all companies have been controlled for insolvencies, excluding all relevant ones.

Table 3-1: Sample characteristics

Variable	Mean	S. d.	Min.	Max
Average firm market capitalization (in million €)	5130.2	14254.5	6.3	85602.1
Turnover (in million €)	6776.6	21298.9	0.1	202458.0
Employees	22348.0	66611.7	13	592586
Family firms	48.0%	.5	-	-
First generation family firms	24.4%	0.4	-	-
Later generation family firms	22.7%	0.4	-	-
Industry industrials	25.3%	0.4	-	-
Industry software	13.8%	0.3	-	-
Industry pharma	11.1%	0.3	-	-
Firm age (in years)	59.5	53.3	1	347

Note: sample characteristics based on n = 225; all data from 2014, except bid-ask spreads (as per 2015)

To obtain the data for this sample, we employed several sources. First, Datastream was used to access financial data including bid-ask spreads and market capitalization. Second, firm characteristics, including ownership structure, debt ratio, performance, industry, and TMT composition were obtained from Deutsche Börse, the operator of the Frankfurt Stock Exchange. Third, disclosure information was collected manually from the companies' statements accessible on their websites. Fourth, Amadeus Databank was used to collect otherwise unobtainable data, e.g., family ownership via third companies. Spreads were collected for both 2014 and the first half of 2015, all other data was collected for the year 2014 to control for lagged effects. Unfortunately an analysis over a longer time period was not possible, as disclosure regulations changed from 2013 to 2014, making any longitudinal study impossible.

Measures

Dependent variable. The dependent variable in the analysis is liquidity. To measure the liquidity of companies, we use the bid-ask spread, as the spread presents “a natural measure of the cost of illiquidity” (Amihud & Mendelson, 1986b: 44) and shows strong negative correlations with other characteristics of stocks which reflect liquidity. It is defined as the annual average of the daily closing bid-ask spreads divided by the daily closing prices (compare e.g., Ali et al., 2007). Due to its skewness, the natural logarithm of the variable was used in our analysis.

Independent variables. Family firm status is the independent variable of our analysis. Following the European Commission (2009), family firms are defined as companies whose founder, acquirer, or their heirs hold at least 25 percent of the voting rights. The variable family firm status is a dummy variable with a value of 1 for family firms and a value of 0 for non-family firms.

In separate analyses, we replace family firm status with the variables first generation family firm and later generation family firm. Both variables are dummies with 1 for the named generation in charge and 0 otherwise. Family firms are denoted as first generation family firms when the founding generation of the company is still in charge, i.e., when the dominant role in the management is held by a member of the first generation or when the first generation holds the majority of voting rights within the family in the case that no family member holds an active position in the management.

Mediator variable. The mediator variables in our analysis are voluntary disclosure of corporate governance practices and timely presentation of accounting information of firms. To measure the readiness of companies to deliberately disclose information, we required a source that has the same prescriptions for all firms to be objective and the same

format to be comparable. As our sample consists only of firms that are part of the Prime Standard, regulations are very strict, leaving little room for differences in disclosure of important information. One exemption for this purpose is the German Corporate Governance Codex (DCGK), which “presents essential statutory regulations for the management and supervision of German listed companies and contains, in the form of recommendations and suggestions, internationally and nationally acknowledged standards for good and responsible corporate governance” (<http://www.dcgk.de/en/home.html>). The DCGK is legally based on §161 of the Stock Cooperation Act and consists of mandatory regulations and non-mandatory recommendations (indicated by the word “shall”) and suggestions (indicated by the word “should”) for all listed German companies. Crucial for our research is that even though the code’s recommendations are non-mandatory, deviations thereof (however not of the suggestions) have to be published in the “declaration of conformity”, a separate annual publication mandatory for all listed companies. The code represents a guideline for “the best practice of corporate governance”. Furthermore, it “aims at enhancing the German corporate governance system’s transparency and comprehensibility, in order to strengthen the confidence of international and national investors, clients, employees and the general public in the management and supervision of German listed companies” (<http://www.dcgk.de/en/home.html>). We therefore scanned the DCGK for recommendations that influence the transparency or extent of information of the companies. We identified six different recommendations within the DCGK that are relevant for the transparency of a company. While four of these recommendations seem to be widely accepted and complied with, two of the recommendations are worth analyzing. Paragraph 4.2.5 of the DCGK states that companies shall provide individualized, detailed information about their management’s compensation, presented

in a specified format. This can be taken as a proxy for corporate governance disclosure, as it closes the information gap between insiders and outsiders about management compensation. Paragraph 7.1.2 sentence 4 states that the “Consolidated Financial Statements shall be publicly accessible within 90 days of the end of the financial year; interim reports shall be publicly accessible within 45 days of the end of the reporting period” (<http://www.dcgk.de/en/home.html>). We take this as a measure for the complete and timely disclosure of accounting information.

Control variables. Following the literature, we control for several factors that influence the liquidity of firms. Size, as one of the main drivers of liquidity (Amihud & Mendelson, 1986a), is included and measured via the natural logarithm of the annual average of daily market capitalization, as this information is accurately and readily available for large firms (Leitterstorf & Rau, 2014). Consistent with other studies (Anderson et al., 2009; Chen et al., 2014) we also control for performance, measured as the natural logarithm of the return on total assets in $t-1$, and debt ratio, defined as the natural logarithm of long-term debt divided by total assets. Furthermore, we include a dummy variable for firm industry to control for possible differences between industries. To control for blockholder effects that are not particular family firm effects, we include non-family blockholdership as a control variable in a separate analysis. Non-family blockholdership is a dummy variable with the value 1 for all firms where a non-family blockholder owns at least 25 percent of the voting rights and 0 for all other firms.

Analysis

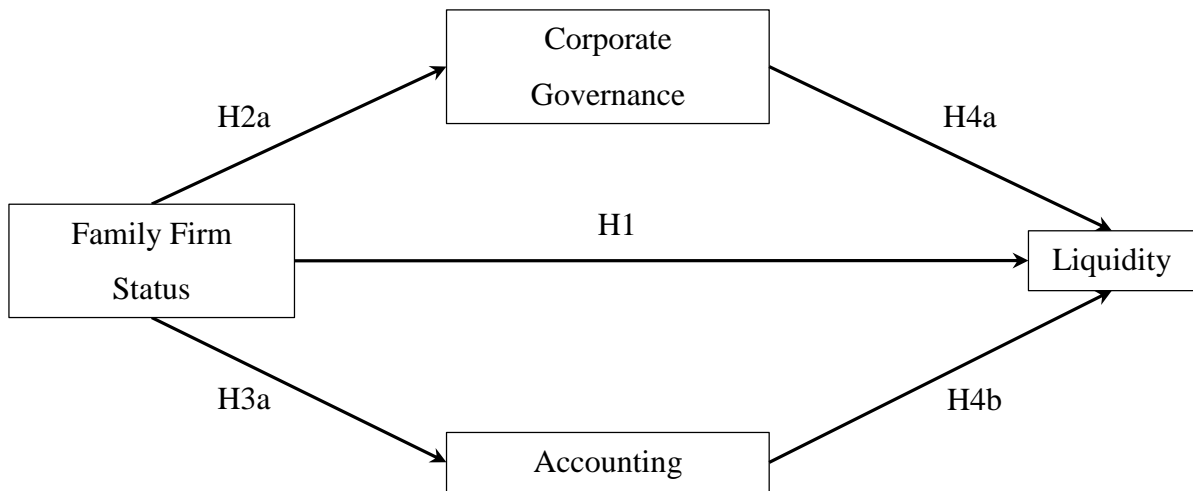
To test our hypotheses, we use multiple hierarchical regression analysis, rolling out the regression model step-by-step, including the variables in a pre-specified sequence. As described in the literature (Cohen et al., 2013), we first build a base model that regresses

the dependent variable *liquidity* only on the control variables. To test hypothesis 1, we include the independent variable *family firm status* (see Figure 3-1). In separate analyses, we control for the blockholdership effect and the generational effect of family firms on liquidity. In order to test hypothesis 2a, we first regress *voluntary corporate governance disclosure* on the control variables and the independent variable *family firm status*. Next, we regress *voluntary corporate governance disclosure* on *first generation family firm* and *later generation family firm* to test the generational effect of hypothesis 2b. We regress *voluntary accounting information disclosure* on the control variables and the independent variable *family firm status* to test hypothesis 3a, followed by the regression on *first generation family firm* and *later generation family firm* to test the generational effect of hypothesis 3b.

Finally we test hypotheses 4a and 4b, the mediation effect of *voluntary corporate governance disclosure* between *family firm status* and *liquidity* and the mediation effect of *voluntary accounting disclosure* between *family firm status* and *liquidity*. Two Sobel-Goodman mediation tests (Goodman, 1960; Sobel, 1982) between the independent variable, the mediation variables, and the dependent variable are conducted to calculate the strength of the direct effect of *family firm status* on *liquidity* and the indirect effect of *family firm status* via *voluntary disclosure* (of corporate governance practices and accounting information) on *liquidity* (Goodman, 1960; Preacher & Hayes, 2008; Sobel, 1982). Following the literature that has criticized the use of the Sobel-Goodman mediation test for small samples (e.g., Shrout & Bolger, 2002), we use bootstrapping with 1000 repetitions to enhance the quality of our results (Bollen & Stine, 1990; Preacher & Hayes, 2008; Shrout & Bolger, 2002).

Additionally to the Sobel-Goodman test, we follow Baron and Kenny (1986) and similar recent literature (e.g., Gómez & Maícas, 2011) to confirm the findings of the mediating role of *voluntary disclosure*, as this causal-steps strategy is the most commonly used method (Preacher & Hayes, 2008). The first step conducts the total effect of *family firm status* on *liquidity*. The second step regresses the mediator on the independent variable, testing the effect of *family firm status* on *voluntary disclosure* (of corporate governance practices and accounting information). The third step regresses the dependent variable on both the mediators and the independent variables, therefore conducting the full model, including control variables, *family firm status*, and *voluntary disclosure* to test for the relation of *voluntary disclosure* to *liquidity* while the independent variable *family firm status* is held constant. Finally, the fourth step tests for the mediation effect by assessing the difference between the total effect of *family firm status* on *liquidity* without *voluntary disclosure* and the effect of *family firm status* when including the mediation variables (Shrout & Bolger, 2002).

Figure 3-1: Path model of family firm status on liquidity



We rely on ordinary least squares (OLS) estimations as the estimation method to fit our model. To run an OLS regression, it is critical to assume constant standard deviations of the error terms across all independent variables, i.e., homoscedasticity (Hair, 2010). To test for potential heteroscedasticity, we perform the White test and the Breusch-Pagan/Cook-Weisberg test on both of our full regression models. According to the White test, heteroscedasticity can be rejected ($\chi^2(45) = 40.55$, $p > \chi^2 = .661$ and $\chi^2(45) = 47.51$, $p > \chi^2 = .371$) for both models. Equally, the Breusch-Pagan/Cook-Weisberg test supports the assumption of homoscedasticity ($\chi^2(1) = 0.10$, $p > \chi^2 = .752$ and $\chi^2(1) = 0.08$, $p > \chi^2 = .773$).

RESULTS

In this section, we first present the descriptive statistics and correlations and show the results of our tests for multicollinearity. Next, we show the regression results of the control model, not including any independent variables. In addition, we analyze the effect

of family firm status on liquidity, including family firms' generational effects. Following the presentation of the results of the regressions on accounting information disclosure and corporate governance disclosure, the results of the tested mediation effect of disclosure between family firm status and liquidity sum up this section.

Descriptive Statistics and Correlations

Table 3-2 describes the means, standard deviations, and correlations of all control, independent, and dependent variables. As expected, the control variables firm size ($\beta = .31, p < .001$) and profitability ($\beta = .31, p < .001$) show highly significant positive correlations with liquidity, confirming their importance for the construct. The negative correlation of debt ratio and liquidity is marginally significant ($\beta = -.12, p < .1$); controlling for industries, except that the software industry shows a significant lower liquidity ($\beta = -.18, p < .01$). Family firm status is significantly and positively correlated with the dependent variable bid-ask spread, i.e., it shows a significant negative correlation with liquidity ($\beta = -.18, p < .01$). Further, family firm status is significantly and negatively correlated with the two mediator variables accounting information disclosure ($\beta = -.17, p < .1$) and corporate governance information disclosure ($\beta = -.26, p < .001$). Strong generational differences can be seen among family firms. While first generation family firms are highly correlated with lower liquidity ($\beta = -.38, p < .001$) and show a significant and negative correlation with accounting information disclosure ($\beta = -.21, p < .01$), later generation family firms show a significant and positive correlation with liquidity ($\beta = -.26, p < .05$) and no significant correlation with accounting information disclosure. Similarly, first generation family firms show no significant correlation with corporate governance information disclosure, while later generation family firms show a highly significant and negative correlation with corporate governance information disclosure ($\beta = -.16, p < .001$). Corporate governance information disclosure shows a positive yet

insignificant correlation with the bid-ask spread; accounting information disclosure in contrast shows a highly significant and positive correlation with liquidity ($\beta = .24$, $p < .001$).

Furthermore, we calculate the variance inflation factors (VIF) for all variables to account for potential issues of multicollinearity. To incorporate only relevant multicollinearity, standardized values were used for all non-binary variables. Two separate tests were conducted so as not to mix family firm status and family firms' generational dummies. With a highest VIF of 1.43 (first generation family firm) and mean VIFs of 1.23 and 1.18, values are well below the recommended cutoff-value of 10.00 (MacKenzie et al., 2011), indicating no issues of multicollinearity.

Table 3-2: Descriptive statistics and correlation table

	Mean	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Firm size (in million €)	5130.15	14254.53												
2. Profitability (ROA)	.01	.18	.08											
3. Debt ratio	.27	.29	.11	-.21**										
4. Industry industrials = 1	.25	.44	-.09	.05	-.02									
5. Industry software = 1	.14	.35	-.06	.07	.02	-.23***								
6. Industry pharma = 1	.11	.32	-.05	-.26***	-.03	-.21**	-.14*							
7. Non-family firm with blockholder = 1	.17	.38	-.10	-.01	.01	-.04	-.11+	-.01						
8. Family firm status = 1	.48	.50	-.08	.08	.00	-.13+	.21**	-.06	-.31***					
9. First generation family firm = 1	.24	.43	-.17**	-.04	.04	-.09	.31***	-.00	-.17**	.59***				
10. Later generation family firm = 1	.23	.42	.07	.13+	-.04	-.05	-.09	-.09	-.19**	.56***	-.31***			
11. Corporate governance disclosure = 1	.85	.36	.12+	-.13+	.05	.04	-.05	.11	.05	-.26***	-.06	-.26***		
12. Accounting information disclosure = 1	.76	.43	.15*	-.06	-.02	.11+	-.14*	-.07	.14*	-.17*	-.21**	.03	.24***	
13. Liquidity (1)	-.02	.01	.31***	.31***	-.12+	.07	-.18**	.00	-.00	-.18**	-.38***	.16*	.05	.24***

N=225; + p < .1 * p < .05; ** p < .01; *** p < .001; (1) Liquidity represents the inverted bid-ask spread

Regression Results

Regression on liquidity. Tables 3-3 and 3-4 describe the results of our robust OLS regression on liquidity. The dependent variable is liquidity, measured as the relative bid-ask spread of shares (inverted, as the bid-ask spread is negatively correlated with liquidity (Amihud & Mendelson, 1986a)); the independent variables family firm status, first generation family firm and later generation family firm are measured as dummy variables.

In the first model we control for firm size, profitability, debt ratio, and industry. As can be seen in Table 3-3, firm size shows a highly significant positive effect on liquidity ($\beta = .351, p < .001$), with profitability ($\beta = .338, p < .01$) and pharma industry ($\beta = .259, p < .01$) also showing significant positive effects on liquidity. Software industry is marginally significant and negative on liquidity ($\beta = -.140, p < .1$). The explained variance (R^2) of the control model accounts for 80.0%, highlighting the importance of the control variables in this context. To test hypothesis 1, to what extent family firm status influences liquidity, we include the independent variable family firm status in Model 2. The results show that family firm status has a significantly negative effect on liquidity of firms ($\beta = -.119, p < .05$), therefore supporting hypothesis 1 that family firms' shares have a lower liquidity than non-family firms' shares. Although the likelihood ratio test shows a significant improvement of Model 2 compared to Model 1, the additionally explained variance is very small (ΔR -squared = .5%). This again emphasizes the importance of the control variables in our analysis and especially of firm size, which alone accounts for the greatest part of the explained variance. To gain further insights into the underlying effects of the ownership structure, we extend our analysis by including family firms' generational effects and add the control variable *blockholdership in non-family firms* in a separate analysis (see Table 3-4).

Interestingly, the results of Model 3 (Table 3-3) show that only first generation family firms have a significantly lower liquidity than non-family firms ($\beta = -.158, p < .05$). While later generation family firms also show a negative influence on liquidity, this effect is not significant. In a separate analysis (see Table 3-4) we additionally included the control variable *non-family firms with blockholder* as a dummy variable to test for family firm status effects that go beyond blockholder effects. As can be seen in Model 2, both non-family firms with blockholders ($\beta = -.198, p < .01$) and family firms have significantly lower ($\beta = -.167, p < .01$) liquidity than non-family firms without blockholders. While hypothesis 1 is thereby still supported, the higher coefficient of non-family firms with blockholders indicates that it is not family firm status itself, but rather the ownership structure (i.e., blockholdership) that leads to lower liquidity. Model 3 supports this indication, as all three, non-family firms with blockholders ($\beta = -.196, p < .01$), first generation family firms ($\beta = -.202, p < .01$), and later generation family firms ($\beta = -.136, p < .05$), have significantly lower liquidity than non-family firms without any blockholder.

Table 3-3: Results of regression analysis for liquidity

	Base model	Independent variable model	Generational model
	Model 1	Model 2	Model 3
<i>Controls</i>			
Firm size	0.351***	0.347***	0.343***
Profitability	0.338**	0.359**	0.358**
Debt ratio	0.085	0.088	0.103
Industry industrials	0.069	0.054	0.055
Industry software	-0.140+	-0.113	-0.101
Industry pharma	0.259**	0.251**	0.250**
<i>Independent variables</i>			
Family firm status		-0.119*	
First generation family firm			-0.158*
Later generation family firm			-0.087
R-squared	.800	.805	.805
Comparison to	-	Model 1	Model 1
Δ R-squared	-	.005	.005
Likelihood-ratio χ^2	-	5.030*	5.880+
Adjusted R-squared	.795	.798	.798

N=225; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

Table 3-4: Results of regression analysis for liquidity, controlling for non-family blockholdership

	Base model	Independent variable model	Generational model
	Model 1	Model 2	Model 3
<i>Controls</i>			
Firm size	0.350***	0.345***	0.341***
Profitability	0.345**	0.378***	0.376***
Debt ratio	0.087	0.092	0.107
Industry industrials	0.059	0.033	0.033
Industry software	-0.160+	-0.133	-0.124
Industry pharma	0.253**	0.240**	0.236**
Non-family firms with blockholder	-0.129+	-0.198**	-0.196**
<i>Independent variables</i>			
Family firm status		-0.167**	
First generation family firm			-0.202**
Later generation family firm			-0.136*
R-squared	.803	.811	.812
Comparison to	-	Model 1	Model 1
Δ R-squared	-	.008	.009
Likelihood-ratio χ^2	-	9.170**	9.850**
Adjusted R-squared	.797	.804	.804

N=225; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

Summing up, hypothesis 1 is supported by our regression results. The theoretical implication that not only blockholdership of the families but also family specific behavior with regard to holding periods and increased informational friction due to family firm specific preferences cannot be supported by our analyses. Including the control variable *non-family firms with blockholders* shows that these firms have even lower liquidity than family firms. This indicates that not family specific characteristics, but blockholdership affects liquidity. Interestingly, first generation family firms are less liquid than later generation family firms even though, on average, fewer voting rights are owned by the family in these firms (46.6%) than in later generation family firms (52.2%).

Regression on corporate governance information disclosure. Table 3-5 describes the results of our robust OLS regression on corporate governance information disclosure. The dependent variable is corporate governance information disclosure, and family firm status, first generation family firm and later generation family firm are the independent variables.

In Model 1, we control for firm size, profitability, debt ratio, industry, and non-family firms with blockholders. As can be seen in Table 3-5, none of the control variables has a significant effect on corporate governance information disclosure. Accordingly, the explained variance (R^2) of the control model only accounts for 3%. This indicates that firm characteristics that are independent of the individual owners do not have an effect on corporate governance disclosure. To test hypothesis 2a, we include family firm status in the analysis. As predicted, family firm status shows a highly significant negative effect on corporate governance information disclosure ($\beta = -.174, p < .001$), therefore supporting hypothesis 2a. The increase in the explained variance by .050 and the highly significant improvement of the model ($\chi^2 = 12.03, p < .001$), further support hypothesis 2a. In Model

3, we include first generation family firm and later generation family firm as independent variables of our analysis to test hypothesis 2b. Supporting our hypothesis, later generation family firms show a highly significant and negative effect on corporate governance information disclosure ($\beta = -.253, p < .001$), while first generation family firms show no significant effect on corporate governance information disclosure. The increased model fit ($\chi^2 = 17.57, p < .001$) and the increased explanation power of .073 compared to the control model further support the hypothesized effect. Interestingly, both first generation family firm and non-family with blockholder show only very weak and insignificant effects.

Table 3-5: Results of regression analysis for corporate governance information disclosure controlling for non-family blockholdership

	Base model	Independent variable model	Generational model
	Model 1	Model 2	Model 3
<i>Controls</i>			
Firm size	0.014	0.009	0.016
Profitability	-0.130	-0.095	-0.096
Debt ratio	0.084	0.089	0.066
Industry industrials	0.060	0.032	0.028
Industry software	0.007	0.034	-0.008
Industry pharma	0.116	0.102	0.082
Non-family firm with blockholder	0.055	-0.017	-0.021
<i>Independent variables</i>			
Family firm status		-0.174***	
First generation family firm			-0.094
Later generation family firm			-0.253***
R-squared	.033	.083	.106
Comparison to	-	Model 1	Model 1
Δ R-squared	-	.050	.073
Likelihood-ratio χ^2	-	12.030***	17.570***
Adjusted R-squared	.002	.050	.068

N=225; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

Regression on accounting information disclosure. Table 3-6 shows the robust OLS regression results on accounting information disclosure. The dependent variable is accounting information disclosure; family firm status, first generation family firm and later generation family firm are again the independent variables.

The control model includes firm size, profitability, debt ratio, industry, and non-family firms with blockholders. Firm size shows a strong positive and highly significant effect on accounting information disclosure ($\beta = .057, p < .001$). Furthermore, non-family firms with blockholders are interestingly significantly more willing to provide accounting information ($\beta = .158, p < .05$), while profitability shows a marginally significant and negative effect on accounting information disclosure ($\beta = -.211, p < .1$). Together, the control variables account for 12% of the explained variance. Family firm status and first generation family firm show significant negative pairwise correlations with accounting information disclosure (see Table 3-2). However, including the independent variables family firm status (in Model 2) and first generation family firm and later generation family firm (in Model 3) in the regression model brings no further significant effects. All three variables have weak negative but insignificant coefficients, offering no support for hypotheses 3a and 3b. A very small increase in the variance explained (.004 and .005 respectively) together with no significant improved model fit further indicate that family firm status has no significant effect on accounting information disclosure. Running a separate analysis (see Table 5-5, appendix) without the control variable non-family firms with blockholders shows a marginally significant and negative effect of family firm status on accounting information disclosure ($\beta = -.094, p < .1$), giving some support to hypothesis 3a. Testing for generational differences among family firms in this analysis brings no significant results; however, first generation family firms show some indication of a negative effect on accounting information disclosure ($\beta = -.120, p = .105$).

Table 3-6: Results of regression analysis for accounting disclosure controlling for non-family blockholdership

	Base model	Independent variable model	Generational model
	Model 1	Model 2	Model 3
<i>Controls</i>			
Firm size	0.057***	0.055***	0.051***
Profitability	-0.211+	-0.198+	-0.201+
Debt ratio	-0.065	-0.063	-0.051
Industry industrials	0.107	0.097	0.100
Industry software	-0.069	-0.059	-0.047
Industry pharma	-0.092	-0.097	-0.094
Non-family blockholder	0.158*	0.132+	0.139+
<i>Independent variables</i>			
Family firm status		-0.062	
First generation family firm			-0.089
Later generation family firm			-0.019
R-squared	.122	.126	.127
Comparison to	-	Model 1	Model 1
Δ R-squared	-	.004	.005
Likelihood-ratio χ^2	-	1.140	1.460
Adjusted R-squared	.093	.094	.091

N=225; uncentered coefficients are reported.

+ $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

To sum up, although there is some indication that supports hypotheses 3a and 3b, results on the basis of our data are not clear. Hypotheses 3a and 3b can therefore not be supported; further research is necessary to clarify these effects.

Voluntary disclosure as mediator between family firm status and liquidity. To test hypotheses 4a and 4b, Tables 3-7 and 3-8 show the regression results of our mediation tests for corporate governance disclosure and accounting information disclosure. To conduct these tests we first follow the 3-step model of Baron and Kenny (1986). Model 1 in each table shows the control model, including the control variable non-family firm with blockholder. Model 2 in both tables shows the total effect of family firm status on liquidity. Model 3 tests the effect of the mediator variable (corporate governance disclosure in Table 3-7, accounting information disclosure in Table 3-8). Model 4 presents the full model, including the independent variable family firm status and the mediator variables.

While family firm status has a significant negative total effect on liquidity ($\beta = -.167$, $p < .01$) as already shown in Table 3-2, the mediator variables corporate governance disclosure and accounting information disclosure show positive yet insignificant effects on liquidity. This indicates that hypotheses 4a and 4b are not supported by our results. The full models in both tables support this indication, as both mediator variables are again insignificant in their effect on liquidity. The effect of family firm status on liquidity is still significant ($\beta = -.163$, $p < .01$) and ($\beta = -.165$, $p < .01$) and loses only little of its magnitude compared to the independent variable model. Further support for the rejection of hypotheses 4a and 4b is given by almost no increase in the variance explained by the model (the adjusted R-squared even drops slightly) which is mirrored by no significantly improved model fit for both models.

The Sobel-Goodman test for the mediating role of corporate governance disclosure further supports the indication given by the regression results. While the total and the direct effect of family firm status on liquidity are again shown to be significantly negative,

we find no significant effect of corporate governance disclosure on liquidity. Therefore, we conclude that there is no indication for the role of corporate governance disclosure as a mediator between family firm status and liquidity in our analysis.

The Sobel-Goodman test for the mediating role of accounting information disclosure shows different results. The total effect of family firm status on liquidity is significantly negative ($\beta = -.310, p < .01$). Including the mediator variable accounting information disclosure leaves a significantly negative direct effect of family firm status ($\beta = -.245, p < .05$), but also shows a highly significant and positive effect of accounting information disclosure on liquidity ($\beta = .447, p < .001$). Furthermore, family firm status has a significantly negative effect on accounting information disclosure ($\beta = -.144, p < .05$). This leads to a weak but significantly negative indirect effect of family firm status on liquidity ($\beta = -.064, p < .05$) via the mediator. Bootstrapping with 1000 replications supports these results. Following the Sobel-Goodman test, 20.7% of the total effect of family firm status on liquidity is mediated by accounting information disclosure, indicating a partial mediation. These results, however, are questionable. Most importantly, firm size as the dominating variable to explain liquidity (see regression results on liquidity) is not accounted for by the Sobel-Goodman test. As can be seen in the mediator model in Table 3-8, including the control variables into the regression leaves only a weakly positive and insignificant effect of accounting information disclosure on liquidity. This suggests that accounting information disclosure does not itself act as a mediator. As can be seen in Table 3-6, Model 1, firm size is a good predictor of accounting information disclosure. It is therefore possible that the correlation between size and voluntary accounting information disclosure explains the results of the Sobel-Goodman test.

Replacing the independent variable family firm status with our alternative independent variables first generation family firm and later generation family firm does not change any of the present results in this part of our analysis.

Table 3-7: Results of regression analysis for corporate governance disclosure as mediator between family firm status and liquidity

	Base model	Independent variable model	Mediator model	Full model
	Model 1	Model 2	Model 3	Model 4
<i>Controls</i>				
Firm size	0.350***	0.345***	0.349***	0.345***
Profitability	0.345**	0.378***	0.354**	0.381***
Debt ratio	0.087	0.092	0.081	0.090
Industry industrials	0.059	0.033	0.055	0.032
Industry software	-0.160+	-0.133	-0.160+	-0.134+
Industry pharma	0.253**	0.240**	0.245**	0.237**
Non-family firm with blockholder	-0.129+	-0.198**	-0.133+	-0.198**
<i>Independent variable</i>				
Family firm status		-0.167**		-0.163**
<i>Mediator variable</i>				
Corporate governance disclosure			0.073	0.024
R-squared	.803	.811	.804	.811
Comparison to	-	Model 1	Model 1	Model 2
Δ R-squared	-	.008	.001	.000
Likelihood-ratio χ^2	-	9.170**	.990	.100
Adjusted R-squared	.797	.804	.797	.803

N=225; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

Table 3-8: Results of regression analysis for accounting information disclosure as mediator between family firm status and liquidity

	Base model	Independent variable model	Mediator model	Full model
	Model 1	Model 2	Model 3	Model 4
<i>Controls</i>				
Firm size	0.350***	0.345***	0.347***	0.343***
Profitability	0.345**	0.378***	0.356**	0.386***
Debt ratio	0.087	0.092	0.090	0.094
Industry industrials	0.059	0.033	0.054	0.029
Industry software	-0.160+	-0.133	-0.156+	-0.131
Industry pharma	0.253**	0.240**	0.258**	0.243**
Non-family blockholder	-0.129+	-0.198**	-0.138+	-0.204**
<i>Independent variable</i>				
Family firm status		-0.167**		-0.165**
<i>Mediator variable</i>				
Accounting information disclosure			0.052	0.039
R-squared	.803	.811	.804	.812
Comparison to	-	Model 1	Model 1	Model 2
ΔR -squared	-	.008	.001	.001
Likelihood-ratio χ^2	-	9.170**	.670	.390
Adjusted R-squared	.797	.804	.797	.804

N=225; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

DISCUSSION AND CONCLUSION

Market liquidity of shares is an important characteristic of a firm that can influence more than just the behavior of investors in the market (Foucault et al., 2013). Apart from financial characteristics closely related to the stock markets such as the cost of debt and equity (Amihud & Mendelson, 1986a, 1986b), liquidity can also influence firms in a variety of other ways, e.g., with respect to their investments and economic growth (Henry, 2000; Levine & Zervos, 1998). One important component that the previous literature highlights as a difference between liquid and illiquid investments is the information asymmetry between insiders and outsiders of a company (Akerlof, 1970; Stoll, 2000) which can be reduced by providing voluntary disclosure (Healy & Palepu, 2001). To account for still inconclusive research results in the field of voluntary disclosure and liquidity of family firms (Chen et al., 2014; Gomez-Mejia et al., 2014), we refine previous studies by incorporating generational differences of family firms to account for one aspect of family firm heterogeneity. Based on agency theory (Jensen & Meckling, 1976), the concept of SEW (Gomez-Mejia et al., 2007), and Stoll's (2000) differentiation between real friction and informational friction we developed our hypotheses. Collected data from 225 family and non-family prime-standard firms listed on the Frankfurt Stock Exchange was used to test our hypotheses.

In our results, we find support for hypothesis 1, that family firms have lower liquidity than non-family firms. Furthermore, first generation family firms are less liquid than later generation family firms with the latter not even showing any significant difference in bid-ask spreads compared to non-family firms. In a separate analysis, we included the control variable non-family firms with blockholders to analyze the effect due to family firm specific characteristics compared to the effect due to blockholdership in

companies. While the results confirm that family firms and especially first generation family firms (later generation family firms also, but to a lesser extent) have lower liquidity than non-family firms without a blockholder, non-family firms with a blockholder also show significantly lower liquidity than the control group. This highlights the effect of the ownership structure on liquidity (Brockman et al., 2009; Stoll, 2000) and casts doubt on the hypothesized effect of family firm specific characteristics on liquidity. However, looking at the generational differences between family firms raises again the question of whether there is a family firm specific or generational specific influence on liquidity. As can be seen, first generation family firms have lower liquidity than later generation family firms, even though the latter have on average greater blockholdership.

This leads to the question of generational differences in the disclosure policies of family firms. Family firms are as expected more reluctant to disclose corporate governance information. This is specifically the case for later generation family firms, while first generation family firms show no significantly different behavior from non-family firms. Additionally, non-family firms with blockholders also do not disclose significantly more or less than non-family firms without blockholders. Therefore, this seems to be a specific characteristic of later generation family firms. However, further analyses show that this does not influence the liquidity of these firms. This is in line with the finding that first generation family firms have lower liquidity than later generation family firms. With respect to the disclosure of voluntary accounting information, there are some indications that family firms – and among them mainly firms in the hands of the first generation – are more reluctant to provide this information. There is also some evidence that accounting information disclosure mediates between family firm status and liquidity. This could also be a possible explanation of why first generation family firms' shares are less liquid than those of later generation family firms. These hypotheses,

however, cannot be confirmed, as the size of firms seems to have a substantially greater effect on liquidity that overshadows any possible effect. This makes it necessary to conduct further research in this area.

This study contributes in several ways to the literature of family firms, disclosure policies, and finance. First, our study contradicts the results of previous studies (e.g., Ali et al., 2007; Wang, 2006) that indicate that family firms are more transparent and liquid than non-family firms, but supports the findings of other studies (e.g., Anderson et al., 2009; Chen et al., 2008) that find the opposite effect. Our analysis presents one step towards understanding this ambiguity of previous research (Chen et al., 2014) by taking into account the generational differences among family firms. This supports the approach of more detailed analyses, instead of the *either/or* idea as asked for by Gomez-Mejia et al. (2014). The results indicate that not family firm status alone, but rather the underlying intentions and preferences of the owning family have to be considered when analyzing differences of disclosure policy and liquidity of firms. Further research should be conducted to shed light on additional underlying premises that differentiate family firms among each other. This could also lead to further explanations of why previous studies are inconclusive.

Second, this study contributes to the literature on family firms and disclosure policies by developing and testing hypotheses about why certain types of family firms develop different disclosure policies. In this study we analyze one aspect of firm heterogeneity, generational stage of family firms, and combine agency theory and SEW in our analysis of family firms' disclosure policies. The results highlight again the importance of family firm heterogeneity (Sharma et al., 2012), but also call for further understanding of the underlying intentions of the family as the dominant shareholder.

Taking up Gomez-Mejia et al.'s (2014) call for differentiation among family firms regarding their disclosure policies, we include generational difference in our analysis as a first step towards further understanding of family firms' preferences. Our study confirms that family specific preferences are not "something static but [...] can actually change during the life of the firm" (Gomez-Mejia et al., 2014: 398). While this explains some of the variance between previous studies, further aspects such as SEW preservation, TMT composition (Gomez-Mejia et al., 2014), or conflicts within the family have to be taken into account in future studies.

Third, the results on voluntary disclosure policies as a potential mediator variable between family firm status and liquidity are of interest despite not being significant. Although theoretically increasing liquidity (e.g., Healy & Palepu, 2001), voluntary disclosure of accounting information and corporate governance information turns out to be insignificant when controlling for the size effect of companies. Our further results, however, indicate that the level of accounting information disclosure might have some influence on the liquidity of firms and the Sobel-Goodman Test indicates a mediation effect. No such indications can be found for the level of disclosure of corporate governance information. This is in line with Ali et al. (2007) who find family firms to be more liquid, even though they disclose less corporate governance information. Considering our regression results on liquidity, this can provide some valuable insights. In the context of our analysis, voluntary disclosure has no significant effect on liquidity. Furthermore, no family firm specific influence on liquidity can be proven. Rather, ownership structure is next to size effects in importance, supporting Brockman et al.'s (2009) analysis of blockholdership effects on liquidity. This has several implications. The hypothesized effect of voluntary disclosure on liquidity is not significant in transparent markets such as the shares of the prime standard. Corporate governance disclosure

especially seems to have no effect on liquidity, contradicting the expected market demand for such information (e.g., Wang, 2006) in highly transparent environments. One explanation for this could be that high legal and fiscal transparency, as guaranteed by any firm within the prime standard, can decrease principal-principal problems (Schulze, Lubatkin, & Dino, 2003a) and therefore render voluntary disclosure unnecessary. Following this, the higher reluctance of family firms to disclose such information seems not to have any negative consequences with respect to liquidity, which could lead practitioners to reconsider the positive and negative effects of increased disclosure.

Forth, this study contributes to agency theory and the concept of SEW. Predominantly used in similar studies, agency theory presents explanations for family firms being more transparent as well as for being less transparent compared to non-family firms (Chen et al., 2014). The commonly applied approach is therefore not perfectly suitable to explain differences in the disclosure policies between family and non-family firms. “[N]otably lacking in the literature is the role of [the owning families’] diverse interests in enacting firm discretion in financial reporting” according to Gomez-Mejia et al. (2014: 388). Following the call of these authors, we find that complementing agency theory with SEW tenets yields interesting results in the context of family firms’ disclosure policies and facilitates the understanding of SEW-based preferences of family firms in our analysis. We show that family firms’ preferences change over time, leading to differing disclosure policies between generations. Furthermore, we show that size effects outweigh most other factors that influence liquidity and disclosure policies of firms. This supports the notion of Gomez-Mejia et al. (2011) that SEW considerations differ with firm size. Lastly, we contribute to the agency-based conversation by focusing on blockholders’ preferences rather than on managers’ self-serving activities (Gomez-Mejia et al., 2014). This provides a new perspective on liquidity and disclosure policies that

indicate similarities between family firms and companies with non-family blockholders. Further research should be conducted in this direction to improve our understanding of agency-driven decisions and family firm specific SEW considerations.

Limitations and Future Research Directions

This study bears some limitations that have to be taken into consideration when interpreting the results and applying them in different settings. These limitations also call for further research on this topic, to enhance our insights and improve current shortcomings. Regulations of the German Corporate Governance Codex have only recently been changed. Therefore, only data from 2014 could be used, preventing any longitudinal study. This reduces the explanatory power of our analysis. Future studies should take longer time periods into account when analyzing family firm status and generational differences, to improve the quality of results and to analyze the effect of changes of disclosure policies on liquidity. Furthermore, all firms in our sample are among the most transparent firms in Germany, as they all belong to the prime standard. While this improves the results of our study, by taking only comparable firms in our sample, the general transparency of all these firms is very high, so the results might not apply for less transparent firms or less regulated markets. The effect of voluntary disclosure especially could be greatly increased in less transparent environments. Also, the analyzed firms differ greatly in size. While we control for any size effect, this seems to be the main driver, when analyzing liquidity of such diverse firms. Further studies in different environments and using different samples are needed to analyze the effect of family firm status and generational differences on disclosure and liquidity. Furthermore, our study takes into account only one aspect – the generation in charge – that differentiates among family firms. While this is a first step toward explaining current discrepancies in the literature, future studies should incorporate further aspects such as TMT composition,

family cohesion or conflict, and the families' culture and preferences about control and SEW.

Conclusion

Market liquidity of shares and the disclosure policies of firms are influenced not only by family ownership, but also by generational differences among family firms. Family firms – especially in the first generation – have overall lower liquidity than non-family firms. However, the main reason for this effect seems to lie in the ownership structure of these firms, as non-family firms with blockholders experience similar effects. Furthermore, family firms are more reluctant to disclose corporate governance information. Including generational differences in the analysis shows that this effect is only significant for later-generation family firms. Results concerning the disclosure of accounting information are not as clear, but there are some indications that family firms in general and those of the first generation in particular are more reluctant to provide this information. In an overall highly transparent environment, voluntary disclosure seems to have no significant mediation effect between family firm status and liquidity levels, highlighting again the importance of the blockholder effect compared to informational effects.

DISCUSSION AND CONCLUSION OF THE THESIS

The overarching objective of this thesis is to give insights into the market liquidity of family firms and introduce this construct as an important variable to family business research. The thesis consists of three essays that individually address important aspects of this topic. Essay 1 provides a measure for the liquidity of privately held family firms. This permits future research to include the analysis of exit options and other effects such as the varying agency costs due to increased power of passive shareholders. I based the index of family firm liquidity on the literature of finance on liquidity and family firm specific characteristics drawn from the field of family business research. To develop the index, I relied on the method of formative indices (Diamantopoulos & Winklhofer, 2001; MacKenzie et al., 2011), taking all relevant steps including practitioner and expert interviews to indicate the appropriate factors and a survey of 207 German family firms to validate the index. As a result, I develop the index of family firm liquidity that consists of six indicators that together serve as a measurement of liquidity in these firms. Essay 2 applies this index in the crucial field of innovation of family firms. Based on the literature of family businesses and the research-based view, I hypothesize that share liquidity of privately held family firms leads to improved innovation outcomes in these firms. Furthermore, I propose that this effect is mediated by open communication between family members, i.e., liquidity leads to improved communication which in turn leads to improved innovation outcomes. The results of my analysis of a sample of 126 German family firms of the mechanical engineering industry support these hypotheses, indicating a full mediation of communication between liquidity and innovation outcomes. Essay 3 leads back to the core of the financial literature by analyzing the liquidity of listed family and non-family firms. Building on family business research, I propose that family firms have different preferences with regard to information disclosure and therefore with regard

to liquidity than non-family firms. Furthermore, I develop the hypotheses that generational differences among family firms result in different policies of disclosure and different levels of liquidity. Although a sample of 225 family and non-family firms from the Prime Standard on the Frankfurt Stock Exchange provides evidence that family firms have lower levels of liquidity and are more reluctant to disclose information, the hypothesized mediation effect of disclosure between family firm status and liquidity cannot be supported. Generational differences do show significant effects, especially on the corporate governance disclosure policies of family firms, but also on liquidity levels. In the following paragraphs, I summarize the theoretical contributions, the practical implications, the limitations, and the avenues for further research. I focus on the most important aspects and those that are relevant to all three essays in order to minimize redundancies with respect to the discussions in the individual essays. Table 4-1 provides an overview of the topics addressed.

Theoretical Contributions

This dissertation provides several theoretical contributions to organizational research and family business research in particular, as well as to finance research with a special focus on the literature on liquidity. In the context of these two research streams, the main contributions of my work are the introduction of the construct of market liquidity to family business research and the broadening of the scope of finance research by incorporating family firms' specific characteristics.

By introducing liquidity to family business research, I contribute to the theoretical constructs RBV, agency theory and SEW. Building on the research of Wernerfelt (1984), Barney (1991), and Habbershon and Williams (1999) I use the RBV perspective as the theoretical framework for the analysis in my second essay regarding the effect of liquidity

on innovation in family firms. In this study, I show that liquidity and open communication represent valuable resources that are unique to family firms. While liquidity leads to increased innovation outcomes in family firms by improving communication among family members, publicly owned companies' innovativeness is impeded by higher levels of liquidity (Fang et al., 2014). This answers Pearson et al.'s (2008) call to identify especially those resources that are unique to family firms and imply an involvement of the family. This contributes not only to family firm research, but to organizational research in general. According to the authors, "[t]o understand this unique interplay of social structure and economics is an opportunity for the advancement of organizational science" (Pearson et al., 2008: 966). Indeed, showing the important influence of underlying constructs such as liquidity opens new opportunities to understand the special characteristics of family firms and to understand the development of valuable resources in organizations overall.

For the third essay, we use agency theory complemented by the concept of SEW as the theoretical framework. As shown by Chen et al. (2014), agency theory provides explanations for both sides. While some authors argue based on agency theory that family firms are more transparent than non-family firms (Ali et al., 2007; Wang, 2006), others argue based on the same theory that they are less transparent (Anderson et al., 2009; Chen et al., 2008). To overcome this problem, we complement agency-driven argumentation by incorporating SEW preferences of family firms in the analysis as demanded by Gomez-Mejia et al. (2014). In this study, we show that disclosure policies of family firms are influenced by generational differences, partly explaining mixed results of earlier studies (Chen et al., 2014) and supporting the proposition of Gomez-Mejia et al. (2014) that the influence of SEW changes over time periods in family firms. Furthermore, we show in our analysis that the size effect is the most important driver of liquidity and also

outweighs other factors with its influence on disclosure policies. This dominant role suggests that agency and SEW considerations are influenced by a company's size, supporting the proposition of Gomez et al. (2011). Additionally, this helps to understand differing results of earlier studies that used different samples (compare Ali et al., 2007; Anderson et al., 2009; Chen et al., 2008; Wang, 2006).

Apart from direct applications of liquidity to family business research theories, the construct represents an important and frequently analyzed factor in finance research that has not been included in family business research because of the lack of applicable measures. Following the call of Amihud et al. (2005) to introduce new measures where conventional ones are not applicable, I develop in the first essay the index of family firm liquidity and thereby include the construct of liquidity as an important factor in family business research. In the course of this study, I borrow from finance research and add to the heterogeneity debate within the field of family business research (see Chua et al., 2012) by adding liquidity as an important characteristic that can differentiate among family firms and their behavior. In return, I give back to the finance literature by including family firm specific characteristics that help to explain inconclusive results of earlier studies. Although many studies in the field of family business research acknowledge the need to differentiate among sub-groups of family firms, other fields of research, such as the field of finance, still treat family firms as one unified group. Following calls from previous literature to incorporate differences among family firms into the mainstream literature (e.g., Gomez-Mejia et al., 2014), I broaden the scope of earlier studies (e.g., Ali et al., 2007; Chen et al., 2008; Chen et al., 2014) by controlling for generational effects. My results show that first and later generation family firms differ significantly in their disclosure policies and eventually in the liquidity of their shares. This highlights the importance of accounting for family firm heterogeneity. Furthermore, previous

inconclusive results regarding the disclosure policies and liquidity of family firms (Chen et al., 2014; Gomez-Mejia et al., 2014) can be explained by controlling for subgroups, such as firms led by the first generation compared to firms led by later generations, among family firms. Eventually, using similar constructs enables both research streams to collaborate with each other and answers the call of Zahra and Sharma (2004: 337) that “we must learn to communicate with scholars in sister disciplines and find ways to give back to the disciplines from which we borrow”.

Table 4-1: Overview of topics addressed in this thesis

Topics Addressed	Problem	Theoretical Contribution	Practical Implication	Limitations and Future Research
Combining family business research and the literature on liquidity (all essays)	Although liquidity of shares has an important influence on shareholders and various aspects of companies (see Foucault et al., 2013) it is widely neglected as a variable in family business research.	Adding to the heterogeneity debate of family firms, the essays show that latent variables such as liquidity influence the perception and preferences of family firm shareholders. This shows the necessity to incorporate further theoretical constructs of other disciplines to understand so far inexplicable results of earlier studies.	The results of this dissertation should serve as a starting point for a rational debate about liquidity of family firm shares. More specifically, the results indicate positive effects of increased liquidity that could get family business owners to reevaluate their predominantly negative image regarding liquidity.	This dissertation represents a first example of including liquidity in the analyses of family firm research. Future studies may further investigate the antecedents and outcomes of liquidity of family firms.
Introducing a reliable and valid tool to measure family firms' liquidity (essay 1)	Data restrictions and low trading volume make conventional measurements of liquidity inapplicable to family firms. New measures have to be introduced where conventional ones cannot be used (Amihud et al., 2005).	The first essay of my dissertation develops a new tool to measure family firms' liquidity. This provides the opportunity for family business research to include liquidity in future analyses.	The study develops a tool that may be used by practitioners to indicate the liquidity of firms without actual trades taking place. This can support analyses of exit options, long-term strategies, credit approval processes, or takeover targets.	Due to data restrictions the study could only be conducted cross-sectionally. Future studies should validate the results over time in a panel study, as liquidity is a variable that changes over time.
Innovation outcomes in family firms (essay 2)	Research on innovation in family firms is still inconclusive (Duran et al., 2015). The antecedents and differences of innovation outcomes in family firms are not yet understood.	I show that liquidity and open communication among family members are valuable resources that improve innovation outcomes and are unique to family firms. This broadens our understanding of the RBV in family firms and opens new opportunities to analyze the development of valuable resources by considering underlying, latent variables such as liquidity.	Practitioners in family firms have to consider positive effects of liquidity on their innovation and therefore long-term survival. Extant research indicates that selling shares is frequently considered as acting against the family (Ward, 2004). A rational debate should replace biases and take positive aspects of increased liquidity into account.	The sample used in the analysis of the second essay is rather small and focused on one specific industry in one country. Future studies should validate my results for different contexts and broaden the analysis by testing the effect of liquidity and communication for closely related topics. Family succession or conflicts are promising areas (Ward, 2004).
Giving back to finance literature by introducing family firm specific characteristics (essay 3)	Shareholders are often depicted as a uniform group (Chen et al., 2008), although time horizons as well as economic and non-economic preferences can vary significantly. The finance literature has focused on one standard case and has widely ignored important differences between groups.	This study helps to understand mixed results of earlier studies by complementing explanations based on agency theory with SEW consideration of family firms. We contribute to the agency-based discussion on disclosure policies by shifting the focus to blockholder preferences and increase our understanding of the SEW by incorporating size and generational effects in our analysis.	Our analysis shows that family firm status and generational differences influence the liquidity of listed companies. This can be important for investment decisions and firm analyses. Furthermore, we show that not all disclosure affects liquidity levels, providing the opportunity to adjust policies accordingly.	We use the publications of the DCGK as proxies for disclosure. However, this limits the generalization of our results. Future studies should validate our outcomes for different measures of disclosure. Future research should also broaden the scope by including further differentiating factors of family firms, such as their trans-generational intent.

Practical Implications

Apart from its theoretical contribution, this dissertation has several important practical aspects. First and foremost, family business owners and managers now have the ability to assess the liquidity of their shares with a valid and reliable measure. My newly developed index of family firm liquidity enables them to rate the liquidity of their shares and therefore their exit options without the need to conduct a market survey. In the case of uncertain succession and personal financial distress, this can be of crucial importance. Furthermore, the index provides a tool for non-family stakeholders such as consultants, banks, and other parties dealing with family firms to analyze possible exit options and their long-term influence. By providing this measure of liquidity, I also contribute to practical analyses of takeovers or potential takeover targets.

This thesis also identifies the importance of including liquidity in strategic and operational considerations. As can be seen in my second essay, the behavior of family members changes with the perception of liquidity of their shares. Innovation outcomes as a key aspect of long-term firm survival improve with higher levels of liquidity by stimulating improved open communication among family members. This dissertation therefore shows the importance for family firm managers and owners of incorporating liquidity into their analyses. During interviews with practitioners for my second essay, I repeatedly heard the concern of family firm managers that higher liquidity would lead to a sale by passive shareholders to third parties. The fear of losing control over the firm is dominant in many family firms and significantly influences their behavior (Zellweger et al., 2012). However, I can show that higher liquidity levels also lead to improved open communication among family members. This in turn enables the firm to access a pool of human resources that would otherwise remain passive. Family firm managers therefore

have to balance the reasons for and against higher liquidity taking my findings into account.

With regard to listed family firms, my analyses show that information disclosure does not have the strong influence on liquidity that is predicted by earlier studies (Healy & Palepu, 2001). Corporate governance disclosure in particular seems to have no effect on liquidity levels of firms. Family firm managers can take this finding into account when deciding on their disclosure policies. While earlier studies have proposed a demand for information (e.g., Wang, 2006) that leads to a tradeoff between the family's privacy and benefits of increased disclosure, my findings suggest that some information is not demanded by the market with regard to a firm's liquidity. Therefore, family firm managers have to consider what information is relevant and do not have to disclose other information when the family is reluctant to provide it.

Limitations

This dissertation has to be regarded as having several limitations. First, all three essays are cross sectional in their data. This is due to the nature of anonymous data collection in the first two essays and a recent change in regulations in the third essay. However, liquidity is a construct that changes over time. Conducting analyses with the use of panel data could therefore improve the results of my work by providing clear causal explanations.

Second, the first two essays contain only data collected from one key informant, mostly the firm's CEO. While this approach is similar to that in recent studies (e.g., Kammerlander et al., 2015; Zellweger et al., 2012), collecting data from additional family members is recommended by the literature (e.g., Eddleston & Kellermanns, 2007;

Sharma, 2004; Zellweger et al., 2012) to increase the objectivity of the results. This approach was not possible for my dissertation.

Third, all data collected is from German companies. While this is of advantage in several ways including data availability with Germany's strong "Mittelstand", it also associates this dissertation with some limitations. As all analyses are based on German samples, transferring the results to culturally different countries has to be done with caution. Furthermore, the results of the second essay are based on the German mechanical engineering industry; generalizations to different contexts such as industry, environment, or size of companies should only be made after validating my results. Future studies should account for this limitation and validate the results of my essays for their respective contexts.

Finally, the variables used for voluntary information disclosure in my third essay are dummy variables indicating compliance or non-compliance with the German Corporate Governance Codex for the respective topics. While this is an objective measure, as all prime standard firms have to publish statements regarding the Codex, the measures only represent proxies for information disclosure. Other studies using different proxies of information disclosure might reach different conclusions. This is especially important when it comes to comparing results among studies. Earlier literature is yet inconclusive about family firms disclosure policies and preferences (Chen et al., 2014). However, this can also be because different measures have been applied across studies. Future research has to take these differences into account when comparing results and clearly distinguish between measures to improve this field of research.

Avenues for Further Research

Beyond future research that arises from the limitations associated with this dissertation, several starting points for promising research streams emerge from my findings. Essay 1 opens the possibility for family business researchers to include liquidity as an important variable of influence in their analyses. As my second essay shows, liquidity can have a significant effect on communication between family members and eventually on innovation outcomes in family firms. By introducing the index of family firm liquidity, I provide a new measure that future research can use to analyze differences between family firms in the fields heterogeneity debate (Chua et al., 2012). I offer a starting point by showing that liquidity of family firms positively influences open communication among family members of the owning family. Taking the family as a pool of human resource (Sirmon & Hitt, 2003; Ward, 2004), future studies should transfer these results to related areas that are closely linked to communication. Promising areas of research could include conflicts among family members or the literature on succession to test liquidity's effect in these contexts.

Furthermore, essay 3 highlights the importance of a more differentiated view of family firms in mainstream finance research. Although my results do not support a mediation effect of disclosure between family firm status and liquidity, family firm characteristics do seem to play a role. First generation family firms are less liquid than later generation family firms. In contrast, the latter are more reluctant to disclose corporate governance information. Taking inconclusive results of previous studies on family firms disclosure policies and liquidity into account (Chen et al., 2014), this dissertation offers a starting point for improving future results by acknowledging family firms' heterogeneity. This follows Zahra and Sharma's (2004) call to give back to the research fields we borrow from. Indeed, future studies in the field of finance and liquidity

should account for family firms' differences but can also learn from family business research aside from their standard models of publicly traded companies. I therefore enforce Gomez-Mejia et al.'s notion on the financial literature when they state that "notably lacking in the literature is the role of [the] controlling owners' diverse interests." My dissertation takes a first step toward fill this gap. Further research is needed to add to this research stream.

Finally, this dissertation highlights again the importance of learning from other fields of research. Although family business research has made significant improvements over the last decades, it can still profit from the insights of related research streams. Several important constructs such as liquidity have not been applied to the field of family business research due to non-applicable measures or data restrictions. However, to exclude these constructs from analyses of family firms is to ignore parts of family firms' characteristics. In essay 2 I show that liquidity has a significant influence on innovation outcomes, one of family firms' key aspects. This highlights the fact that ignoring constructs in our analyses because they are difficult to apply in the context of family firms restrains our understanding of underlying determinants. In order to further understand the complexity of family firms and their behavior, it is crucial to learn and borrow even more from other research fields.

Concluding Remarks

Owning families of family firms are financially highly dependent on their company. Without proper diversification, the ability to sell part of their shares or the whole company can be crucial to save the firm or at least their private wealth. Even without actual sales taking place, liquidity of family firm shares is a highly important and emotional topic. While practitioners are often reluctant to talk about liquidity, family business research

has so far excluded this topic from its analyses due to the lack of applicable measures. In this dissertation, I provide a new measure to assess family firms' liquidity and show that the construct has a significant influence on several key aspects of family firms. Furthermore, I show that special characteristics of family firms have an important effect on listed companies as well. Thus, the overall topic of liquidity of family firms and its results remain crucial for family firm researchers and practitioners. This thesis contributes to our knowledge of family business topics and financial topics by providing a valid and reliable tool with which to measure privately held family firms' liquidity, by analyzing the extent to which liquidity influences family firms' innovation outcomes and by testing the effects of family firm specific characteristics on the liquidity of listed companies.

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APPENDIX

Survey for Essay 1

Table 5-1: Overview of measures for essay 1

Variable/Construct	Question(s)	Format Scale
Share liquidity (general item)	How high do you estimate the general tradability of your shares of your company (indifferent of whether it is on the market or within the circle of other owners)?	7-point Likert scale
Legal form	What is the legal form of your company?	Open answer
Listed/non-listed	Are the shares of your company listed on a stock exchange?	Dummy
Equity ratio	What was the equity ratio of your company in the last year?	Continuous (in %)
Asymmetric information	Following which legal requirement is your firm disclosing the annual statement of accounts to the German Federal Gazette?	5 possible answers
	Do you get the annual statement of accounts audited?	Dummy
Blockholder	Which percentage of voting rights is owned by the biggest shareholder?	Continuous (in %)
Maximum/minimum ownership	Are there existing regulations in your bylaws that specify a maximum or minimum ownership of voting rights of a shareholder?	Dummy (if yes: continuous (in %))
Level of supermajority	Which percentage of voting rights is needed to change the bylaws of your company?	Continuous (in %)
Divergence of voting rights and shares	Do all shares of your company have the same voting rights?	Dummy
Number of active shareholders in the business	How many shareholders are actively working in your company?	Open question
Number of active generations	How many generations of your family are actively working in your company?	Open question
Pooling of voting rights	Are there poolings of voting rights that can only vote collectively?	Dummy
Fixed price of sale	Do your bylaws specify a fixed price of sale of shares?	Dummy

Foundation as a shareholder	Is a foundation a shareholder of your company?	Dummy
Legal restrictions though bylaws	Which of these rights or limitations apply to the shareholders of your company?	6 answers, multiple answers possible
Bonding of family to the firm	The reaction of my family to a potential sale is very important to me. It is very important to me what my family thinks of a potential sale of my shares. I care a lot about the opinion my family has of me. My family would consider it treason if I was to sell my shares. The reaction of my family would be very negative if I was to sell my shares of the company. What I do with my shares is of importance to my family	7-point Likert scales
Restriction through third party	How high do you rate the probability that a third party (supplier, client, employees, banks, associations) could interfere with or even prevent a sale of your shares or your company?	7-point Likert scale
Anti-monopoly restrictions	How high do you rate the probability that a sale of your shares is impeded by legal restrictions (e.g. anti-monopoly restrictions)?	7-point Likert scale
Voting rights held by the family	Which percentage of voting rights is held by your family (including you)?	Continuous (in %)
TMT family percentage	How many members has your top management team? How many members of your top management team are family members?	Open questions

Robustness Checks for Essay 2*Robustness check with general liquidity item as independent variable*

To test for the robustness of the index of family business liquidity (Röhm, 2016a), I use a general item as a proxy for liquidity that asks the respondents' perception of total share liquidity. I use this general item as the dependent variable in a separate analysis. Pair-wise correlations show results similar to those using the index of family business liquidity ($\beta = .285$, $p < .01$ with communication; $\beta = .282$, $p < .01$ with innovation). Additionally, I rely on a hierarchical regression model and OLS to analyze the hypothesized relationships. Table 5-1 shows the results of this analysis. Compared to the main analysis, not much changes. Notably, only R&D investments turn out to be insignificant in the full model. This supports the robustness of the index of family business liquidity as a proxy for liquidity.

Table 5-2: Results of regression analysis for innovation with general liquidity item as independent variable

	Base model	Independent variable model	Mediator model	Full mediation model
	Model 1	Model 2	Model 3	Model 4
<i>Controls (individual level)</i>				
CEO age	-0.009	-0.011	-0.009	-0.010
CEO gender	-0.191	-0.148	-0.005	0.009
<i>Controls (firm level)</i>				
R&D investments	0.783***	0.645**	0.362+	0.311
Turnover	-0.294	-0.303	-0.187	-0.196
Number of employees	0.438	0.427	0.327	0.327
Firm age	0.164	0.182	-0.109	-0.088
Generational stage	0.137	0.097	0.102	0.083
Equity ratio	-0.365	-0.306	0.050	0.062
Legal form	0.021	0.004	-0.202	-0.201
<i>Independent variable</i>				
Liquidity of shares (IV)		0.176*		0.089
<i>Mediator variable</i>				
Open communication			0.490***	0.469***
R-squared	0.142	0.179	0.358	0.367
Comparison to	-	Model 1	Model 1	Model 2
Δ R-squared	-	0.037	0.216	0.188
Likelihood-ratio χ^2	-	5.33*	35.67***	32.07***

N=123; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001; Independent variable (IV) = general liquidity item

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

Robustness check with radical innovation scale (Hsu & Chang, 2011) as dependent variable

To test for the robustness of the four-item scale of Mihalache et al. (2012) as a proxy for innovation and to be able to differentiate between the effects of my independent variable and mediator variable on incremental innovation and radical innovation, I used the radical innovation scale by Hsu and Chang (2011) as the dependent variable in a separate analysis. As in the main model, I relied on a hierarchical regression model and OLS to analyze the hypothesized relationships. Table 5-2 shows the results of this analysis. Interestingly, liquidity seems to have a stronger positive effect on radical innovation ($\beta = .522, p < .05$). This is supported by the stronger positive and highly significant effect communication has on radical innovation ($\beta = .500, p < .001$) in the full model. As in the main model, liquidity has only an indirect effect on radical innovation, fully mediated by communication. Compared to the main model, the explanation power of the control variable R&D investments decreases, especially when including communication into the analysis. In the full model, no significant effect of R&D investments on radical innovation can be seen, indicating that compared to innovation in general, radical innovation is less dependent on R&D investments and more dependent on other resources such as open communication between family members.

Table 5-3: Results of regression analysis for innovation with radical innovation scale as dependent variable

	Base model	Independent variable model	Mediator model	Full mediation model
	Model 1	Model 2	Model 3	Model 4
<i>Controls (individual level)</i>				
CEO age	-0.006	-0.010	-0.006	-0.008
CEO gender	-0.492	-0.592	-0.291	-0.338
<i>Controls (firm level)</i>				
R&D investments	0.691**	0.557*	0.235	0.215
Turnover	-0.228	-0.243	-0.111	-0.124
Number of employees	0.260	0.304	0.140	0.163
Firm age	0.240	0.213	0.202	0.195
Generational stage	0.021	-0.062	-0.275	-0.287
Equity ratio	-0.828	-0.919	-0.378	-0.436
Legal form	0.365	0.285	0.123	0.109
<i>Independent variable</i>				
Liquidity of shares		0.522*		0.184
<i>Mediator variable</i>				
Open communication			0.531***	0.500***
R-squared	0.107	0.154	0.298	0.304
Comparison to	-	Model 1	Model 1	Model 2
Δ R-squared	-	0.047	0.191	0.150
Likelihood-ratio χ^2	-	6.69**	29.71***	23.94***

N=123; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001; Dependent variable = radical innovation

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

Robustness check with turnover of new products (percentage of turnover generated by products that are not more than 3 years old) as dependent variable

To analyze the economic results of innovation, influenced by liquidity and communication, I used turnover of new products (defined as the percentage of turnover generated by products that are not more than 3 years old) as the dependent variable in a separate analysis. As in all previous models, I relied on a hierarchical regression model and OLS to analyze the relationships among the variables. Table 5-3 shows the results of this analysis. Although open communication still influences turnover of new products positively and significantly ($\beta = .133, p < .05$) in the full model, its effect is greatly reduced in the main model. Liquidity shows positive but not even marginal significance in Model 2, even though it is not far off ($\beta = .141, p < .15$). On the other hand, R&D investments is positive and highly significant throughout all models. These results have to be interpreted with care, though. While turnover of new products develops over time and was used as a mean over the last three years to smooth out special effects, liquidity and communication could not be measured longitudinally in this study. R&D investments, like turnover of new products, was measured as the mean of the last three years, improving its quality as a predictor in this separate analysis.

Table 5-4: Results of regression analysis for innovation with turnover of new products as dependent variable

	Base model	Independent variable model	Mediator model	Full mediation model
	Model 1	Model 2	Model 3	Model 4
<i>Controls (individual level)</i>				
CEO age	0.001	0.000	0.001	0.001
CEO gender	-0.165	-0.192	-0.112	-0.125
<i>Controls (firm level)</i>				
R&D investments	0.548***	0.512***	0.426***	0.421***
Turnover	-0.114	-0.118	-0.083	-0.086
Number of employees	0.089	0.101	0.058	0.064
Firm age	0.105	0.098	0.095	0.093
Generational stage	-0.098	-0.120	-0.177	-0.180
Equity ratio	-0.029	-0.054	0.091	0.075
Legal form	0.092	0.070	0.027	0.023
<i>Independent variable</i>				
Liquidity of shares		0.141		0.051
<i>Mediator variable</i>				
Open communication			0.142**	0.133*
R-squared	0.195	0.210	0.253	0.255
Comparison to	-	Model 1	Model 1	Model 2
Δ R-squared	-	0.015	0.058	0.060
Likelihood-ratio χ^2	-	2.27	9.20**	7.22**

N=123; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001; Dependent variable = turnover of new products

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

Survey for Essay 2

Table 5-5: Overview of measures for essay 2

	Variable/Construct	Number of Survey Items	Source of Item Wording	Format Scale
Dependent variables	Innovation scale	4	Mihalache et al. (2012)	7-point Likert scale
	Radical innovation	2	Hsu and Chang (2011)	7-point Likert scale
	Turnover generated by new products	1	n.a.	Continuous
Independent variable	Share liquidity of family firms	6	Röhm (2016a)	Mixed
Mediator variable	Open communication	4	Cabrera-Suárez et al.(2014)	7-point Likert scale
Control variables	Firm size	2	n.a.	Continuous (logarithm of number of employees and logarithm of turnover)
	Equity-to-assets rate	1	n.a.	Continuous
	Firm age	1	n.a.	Continuous (logarithm of years since foundation)
	Legal form	1	n.a.	Open answer
	R&D investments	1	n.a.	Continuous (logarithm of R&D investments averaged over the last three years)
	Respondents' age	1	n.a.	Continuous
	Respondents' gender	1	n.a.	Dummy

Regression Results for Essay 3 Excluding Non-Family Blockholdership

Table 5-6: Results of regression analysis for corporate governance disclosure

	Base model	Independent variable model	Generational model
	Model 1	Model 2	Model 3
<i>Controls</i>			
Firm size	0.014	0.009	0.016
Profitability	-0.127	-0.097	-0.098
Debt ratio	0.085	0.089	0.066
Industry industrials	0.056	0.034	0.031
Industry software	-0.002	0.036	-0.006
Industry pharma	0.113	0.103	0.083
<i>Independent variables</i>			
Family firm status		-0.170***	
First generation family firm			-0.089
Later generation family firm			-0.247***
R-squared	.03	.08	.11
Comparison to	-	Model 1	Model 1
Δ R-squared	-	.05	.08
Likelihood-ratio χ^2	-	12.73***	18.23***

N=225; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.

Table 5-7: Results of regression analysis for accounting information disclosure

	Base model	Independent variable model	Generational model
	Model 1	Model 2	Model 3
<i>Controls</i>			
Firm size	0.056***	0.054***	0.050***
Profitability	-0.202+	-0.186	-0.189
Debt ratio	-0.063	-0.060	-0.048
Industry industrials	0.095	0.083	0.085
Industry software	-0.093	-0.072	-0.063
Industry pharma	-0.099	-0.105	-0.104
<i>Independent variables</i>			
Family firm status		-0.094+	
First generation family firm			-0.120
Later generation family firm			-0.054
R-squared	.10	.11	.11
Comparison to	-	Model 1	Model 1
Δ R-squared	-	.01	.01
Likelihood-ratio χ^2	-	2.87+	2.89

N=225; uncentered coefficients are reported.

+ p < .1; * p < .05; ** p < .01; *** p < .001

Note: Constant term not displayed; results derived from robust OLS regression with STATA version 13. Likelihood-ratio test performed with non-robust regression.